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### Potatoes.

Is our country become so poor that it can no longer supply its own inhabitants with food? It really appears to be so this year, for great quantities of potatoes have recently been imported into this city from Scotland and Ireland. A large portion of the last cargo of the steamer *Glasgow* was potatoes, which, after paying the tariff, yielded—we have been told—very handsome profits to the exporters, as they sold them for four times the price obtained in their own markets.—We have been shipping flour, wheat, and corn to Europe, and are now being partly paid back in potatoes. Has this esculent become so difficult to cultivate in our country, that we must have it sent from abroad to supply our wants. The potato rot visited those countries in Europe which are sending us potatoes, a few years ago, with greater severity than our own country, but it appears that the farmers there have devoted more attention to its cure than ours have. This should not be so, for the potato is a native of our continent, and we think it can be raised in as great abundance, and of as good quality by our farmers, as by those in Europe. This is an agricultural subject which demands attention, and we hope these remarks will lead many of our farmers, during the present winter, to adopt measures for cultivating and improving a more extensive potato crop next season.

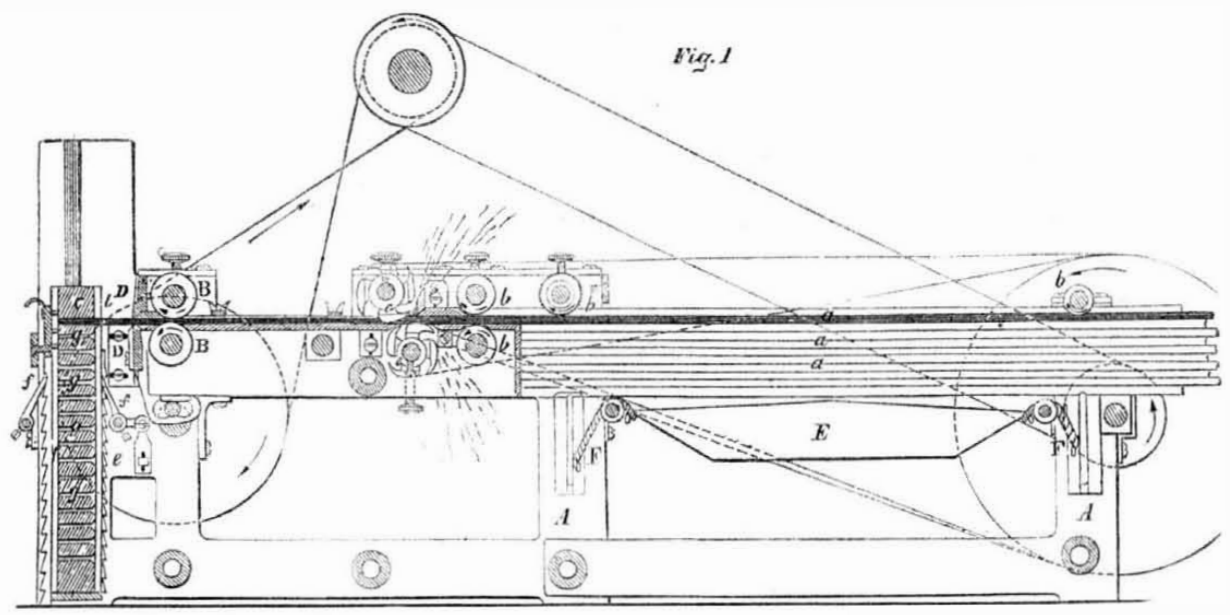
### Match-Making Machine.

The accompanying engravings are illustrative of a very ingenious arrangement of mechanism for the manufacture of friction matches, for which letters patent of the United States was granted to the inventor, Mr. Elkan Adler, of this city, on the 1st of August, 1854. A patent has also been secured in Great Britain.

By far the largest proportion of all the matches made in this country are what are known as split matches—bits of wood split off, by machinery, from a suitable block. After the splitting the pieces require to have their ends furnished with the fulminating compound, which is done by dipping them into a vessel containing the mixture in a liquid form. In the dipping process the end of each match which enters the mixture must be held separate from the others, otherwise the dipped ends would stick together and render it impossible to seperate them afterwards, without ignition. In order to hold the matches properly during the dipping process, a "dipping board" is commonly made use of. This consists of a thin plane board having its surface perforated with small holes, arranged at suitable intervals apart, into which the matches are stuck by hand. The operator takes up the board thus filled with both hands, and dips the ends of the projecting matches into the mixture, when they are all simultaneously coated. After this the matches are removed from the board, and put up in boxes for sale. Such, in brief, is the present mode of manufacturing split matches. All the various processes, except the splitting, it will be observed, are done by hand. In Mr. Adler's improvement, nearly all the work is done by machinery, with a perfection and rapidity that is really surprising. The rough timber is drawn in at one end of the machine, and comes out at the other, transformed into delicately formed, round, polished matches, cut and ready stuck into the "dipping board." A small sized machine, operated by one man, is capable of manufacturing 4,000,000, or 50,000 boxes of matches per diem of 10 hours. While by the employment of another apparatus worked by a second operative, the same quantity of may be taken with equal speed from the match boards and packed in boxes for sale.

## ADLER'S MATCH-MAKING MACHINERY.

*Fig. 1*




The latter invention we shall take another occasion to describe.

In the annexed engravings, figure 1 is a side elevation of Mr. Adler's improvement, and figure 2 a top or vertical view. Similar letters of reference indicate the same parts.

A is the frame of the machine; B the grooved rollers; C the dipping board, into which the matches are stuck prior to dipping; D D are shears by which the matches are cut into proper lengths; E is a self-acting lifter operated by weighted cords, F, whereby the boards, *a a*, are fed up against and carried into the machine by feed rollers, *b b*, as fast as wanted; *c c* are the cutters; *d d* are grooves in the bed plate of the machine, into which the matches pass on their way to the shears D; *l l* is a movable frame which carries the dipping board, C; *e e* is a rack for lifting the frame, *l*; *f f* are pawls for retaining the movement of *l*; *g* are perforations in the dipping board in which the matches are stuck.

OPERATION—The boards out of which the matches are made, are carried in by means of feed rollers, *b b*, between the cutters, *c c*, which divide the stuff into slender strips, round and polished. In the bed plate, a series of grooves, *d*, are cut, which correspond in number to the serrations of the cutters, *c*. The grooves are arranged horizontally side by side at that end of the bed plate, which comes nearly between the cutters. But at the central parts of the bed plate the grooves

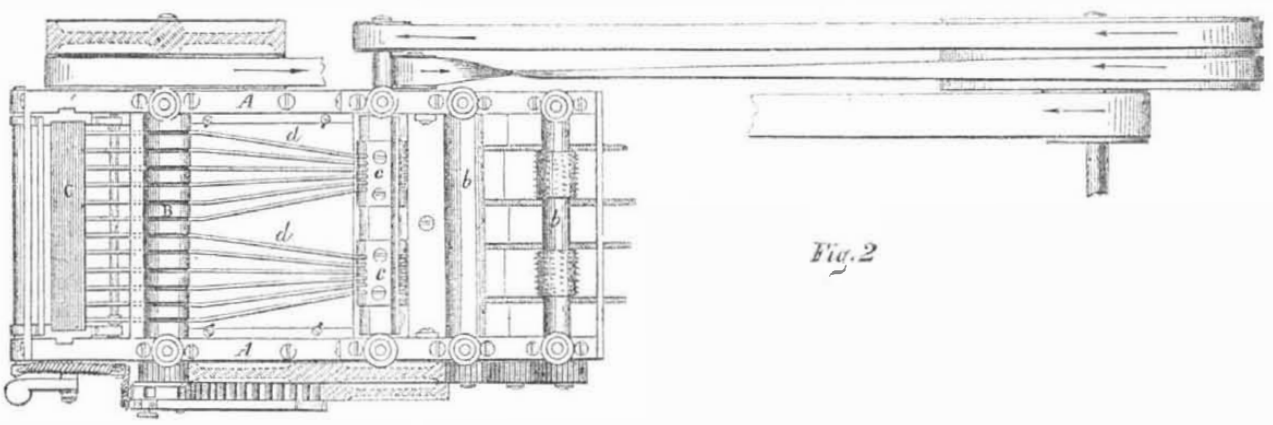



*Fig. 2*

radiate at angles and again assume the horizontal direction, though considerably separated. The match strips pass from between the cutters into the grooves, *d d*, in which they advance towards the shears, D, being separated to the proper distance as they progress by the divergence of the grooves. From the bed plate the match strips pass between the grooved rollers, B B, which carry the ends of the strips into the apertures, *g*, of the dipping board. The apertures in the dipping board are arranged in horizontal rows, and correspond exactly in number and distance to the match strips that issue from the grooves and rollers. At the moment when the match strips have filled one row of perforations in the match frame, the lower shear, D, moves up, and the strips are cut off, leaving a row of matches remaining in the board. which is now carried up one notch by means of the racks, *e*, and pawls, *f*, whereby a new row of holes is presented in front of the rollers. The alternating movements of the rollers, B, shears D, and match frame, *e*, are not here minutely described, as it is deemed unnecessary.

We have seen this machine operate, and can bear testimony to the excellence of the work which it produces.

The inventor informs us that owing to the great amount of hand labor which it supersedes, the manufacturer will be enabled by its use to produce the most elegantly finished matches at a much less cost than even the commonest cloth-backed, split article now used. If desired, the name of the manufacturer can be embossed, in plain letters, upon each match, as it passes through the machine, without expense.

By the removal of the cutters and the substitution of a plain drum, the same machine is ready for use in making wax-taper matches; the waxed wicks press around the drum, and are fed through the grooves into the dipping board in the manner described for wooden matches.

The inventor is desirous of arranging with some individual having suitable means for the manufacture and introduction of matches made under this patent. He feels confident that a fortune can be made from it annually.

Further information can be had on application to Elkan Adler, No. 2 Thompson street, corner of Canal, New York.

### Preparing Objects of Natural History.

J. C. House informs us that copies of a pamphlet containing explicit directions for the preparation of objects of natural history, may be obtained from the proper officers of the Smithsonian Institution.

### Ox Yoke Erratum.

In the description of Heman B. Hammon's ox yoke, on page 100, on the fifth and sixth lines, in stating the nature of the invention, the word "*bow*" should be placed before the word *ferrule*, so as to read "securing over the end of the bow, the ferrule, &c."

### Completion of an Important Improvement.

The Sault Ste. Marie canal will be ready for navigation at the opening of the spring. A vessel may then clear from the head of Lake Superior for any part of the world, and pass through the river St. Lawrence without breaking bulk.

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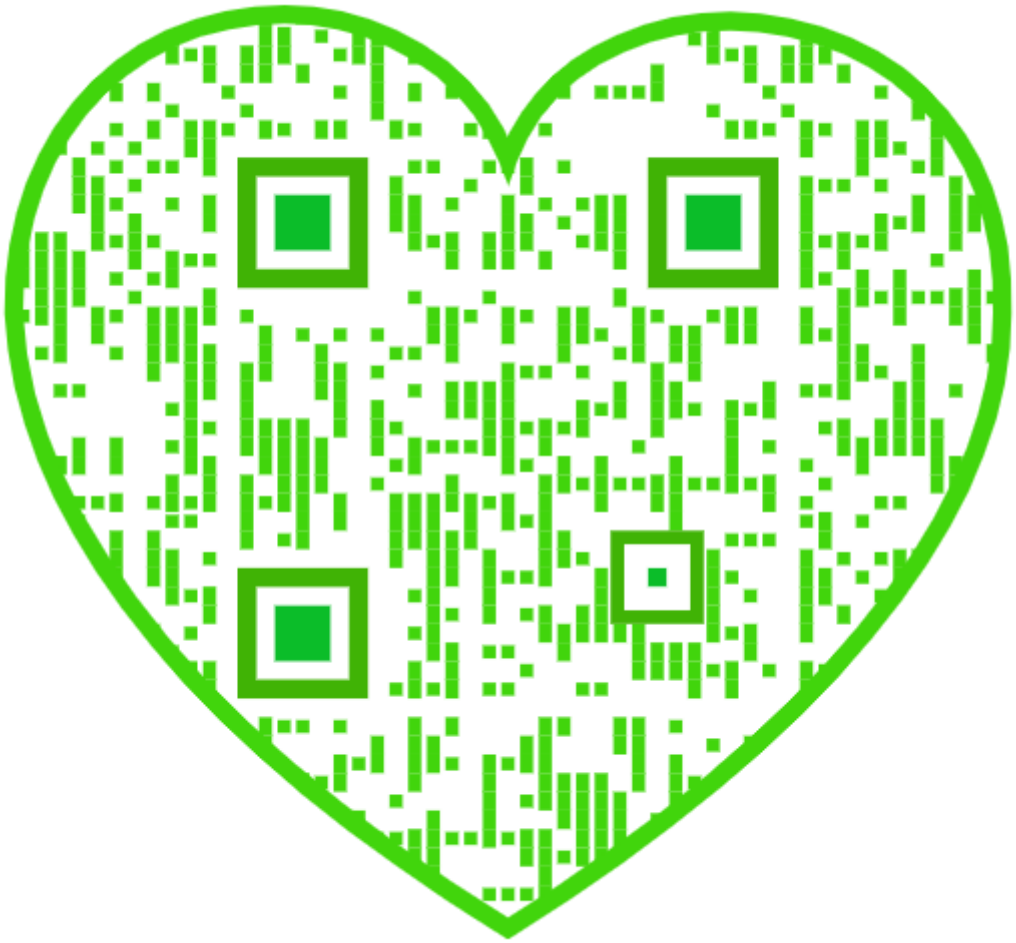

(For the Scientific American.)
**Manufacture of Turks Island Salt.**

From your answer to an Oregon correspondent, which appeared some time since in the SCIENTIFIC AMERICAN, it appears that he inquires as to the method of purifying salt.

From the nature of the business that I have pursued for some years, it is possible I can add something to the knowledge on the subject, but as far as I know, science has given but little aid in the matter; leaving the consumers or manufacturers to gather by experience the necessary improvements in the manufacture of the article.

There was a patent, I think, granted to some one in Western New York, a few years ago, for making or purifying salt by some steam process. Whether this has been successful or not I am unable to say. I have seen some of the salt made by this process, and although the crystals were large and hard, they lacked that transparency which is so peculiar in the best Turks Island salt.—This brings me to the fact established by the experience of ages, that no boiled salt, made either from springs, sea water, or impure rock salt from mines, is as good for salting provisions of any kind as marine salt made by solar evaporation. And of all salt made in this last manner, that which is made in some parts of France enjoys the highest reputation. This is from a cause presently to be stated.

A writer in Rees' Cyclopedia says:—"The English or Dutch have often striven hard in times of war to do without the French salt, and to that end have endeavored to take salt from the Spaniards and Portuguese; but there is a disagreeable sharpness and ferocity natural to this salt, which renders it very unfit for the salting of flesh, fish, &c. To remove this they boil it with sea water and a little French salt, which not only softens it but increases its quantity by one-third. But it should seem that their refining does not succeed to their wish, by the eagerness with which they return to the salt of Bretagne, &c., as soon as any treaty has opened the commerce." The same writer ascribes the reputation the Dutch herring has to the salt that they use. This is called *salt upon salt*, and is prepared from two or more kinds of Marine solar evaporated salt, one of which must be French, which is re-dissolved in sea water, and much pains taken in settling and filtering this brine, and in skimming it while boiling it down to the point of crystallization, which is done in large circular boilers of iron.

Just before it begins to crystallize, they throw into the boiler a small lump of butter as big as a walnut, and a half-pint of sour milk that has stood a year. This is the amount of the chemical means that they use in clarifying this salt, but when they wish the crystals large and hard, they allow it to cool and form into salt very slowly. I presume that the superior quality of this salt depends upon the fact that the most of the salts are rendered purer by re-crystallization, and that many impurities are removed by settling and filtering the brine. I know not of what use the butter is, but I presume the sour milk does good by combining with any free alkali present. It would seem that impurities in sea water or other brines that common salt is made from, have not time for their affinities to separate perfectly, in the rapid process of boiling salt; nor are all these impurities separated by every plan of solar evaporation. The French plan is generally to let in the sea water by a sluice into a large reservoir that is rather higher in level than the salt pans that are built in their marshes.—These pans are at first filled one or two inches deep from the reservoir, and as the water evaporates in the sun from pans and reservoirs, the strengthened pickle is pushed forward, as it were, through winding channels among the pans to the last one in the series; which pan it will be easily understood, will be up to the point of crystallization before any of the rest, as the water from the reservoir does not mix with the strong pickle before it, but pushes this pickle from one pan to another till it arrives at the last. By this plan much salt can be made in a short season in a few of the last pans. But this is not the only advantage, for during the progress of the pickle through the pans and channels, all of the lime and other impurities are deposited out.

The salt-works on this Island are after the French plan, and the pickle traverses some five miles before it arrives at the point where it is pumped into the crystallizing pans; and during the whole course the water deposits its immense quantities of lime and other impurities. The pickle, while at the strength of from 6° to 12° Beaumé, deposites a granular brown mass but little heavier than the water at first, but is the same substance of which the line of coast reefs is formed, it becoming gradually solid limework. The pickle from 12° to 18° deposits crystalline sulphate of lime. The quantity of these and other impurities that are deposited over a surface of 3 to 400 acres, which is covered with these depositing reservoirs at the works here, amounts to two or three inches in depth in one season.

Many of the salt-works in Turk's Island are wholly or partially on the French plan. This accounts for the superiority of the salt from those Islands. The Lisbon and Cadiz salt is inferior, because much of the impurity of the sea water remain with the crystals of salt.

In England and Scotland a tolerably pure salt is made, called "cut salt." This is crystallized on stakes placed under the baskets in which the salt from the boilers is put to drain. Fifty to eighty pounds of salt is allowed to form on each stake, when it is knocked off and is fit for use.

Your correspondent can purify salt fit to cure salmon by dissolving two or three kinds of the best solar marine salt, and treating it after the Dutch method, except to crystallize it. To do this let him pump the pickle, when at the point of crystallizing, into a tank at the top of a tower 40 or 50 feet high, and let this pickle trickle down and crystallize on ropes hanging perpendicular from the top to bottom. It will be easily understood why salt, treated in this manner, is very pure. As a general thing, all of the impurities less soluble than chloride of soda (common salt) is deposited out before the first crystallization and at the last, those more soluble run down the ropes without adhering. This may appear rather wasteful, yet from the strong disposition to crystallize, in a saturated pickle of common salt, but little of this escapes from the ropes. Any one unacquainted with the process would be astonished to see how fast salt does crystallize by the above process. Under a hot sun, or during a drying wind, in twenty-four hours the ropes will become so loaded that the salt will have to be knocked off, and put in store for use.

I will close by observing that there is too little attention given to the quality of salt used in salting provisions in this country.

W. C. D.

Salt Works, Key West, Fla.

[The correspondent to which this communication refers, was C. P. Stratton, of Winchester, Oregon. In the valley where he resides they have many strong saline springs, from which they make salt by evaporation. This salt has a strong bitter taste, like that of Bitterings, which renders it useless. There is also an oily substance combined with it, which renders it offensive. He wished to be informed of the best process of removing these impurities, so as to render the salt fit for use. It appears to us that this will be no easy matter; and the useful information of our correspondent from Key West will not meet the case. The use of a little quick lime stirred in the brine, if it were boiled for a few minutes, would remove any oxyd of iron from it, and would probably combine with the oily substance. The froth should be skimmed off, and the clear allowed to run out into clean pans for solar evaporation, or be reduced by boiling. The bitter taste of the Oregon salt is owing, no doubt, to the great quantity of glauber salts (sulphate of soda) it contains. All sea water contains some of this also, and the above correspondence furnishes the proper information for separating this from the pure muriate of soda (common salt).

(For the Scientific American.)
**Patent Office Fees.**

In a letter on the subject of the Patent Office in the SCIENTIFIC AMERICAN two weeks ago, your correspondent's information was correct as to its being the intention of the Commissioner to recommend in his Report such changes in the Patent Law as would lead to an increase of the revenue of the Office; this he has done since. The necessity of increased taxation on the part of the Patent Office is indisputable, but the mode of levying such tax is certainly open to discussion, and I, for one, cannot acquiesce with your correspondent in his views on that subject.

Of all laws, those relating to the granting of patents for new and useful inventions should be so formed that the privileges to be enjoyed should be within the reach of the poor, and this especially so, for it is the poor, hard-working mechanic that we have to look to for the majority of the practicable improvements that are made. The present $30 application fee, cost of model, and other incidental expenses, form a barrier to many artizans in the way of seeking a patent for their improvements, and deter many from exercising their inventive powers, for they know that until their inventions have passed the Patent Office examination, and been pronounced patentable, they can find but few ready to assist them pecuniarily, except by the sacrifice of the lion's share, but that their improvements having passed the fiery ordeal, command a fair price. I do not see, therefore, how an increase of the application fee, from $30 to $40, will benefit that class whose labors are most prolific of really valuable invention; nor that the increase would materially expediate the examining process. The law before the Senate last winter doubtless was objectionable in some respects as regards the complicity of fees, but on the whole it exhibited a principle which, by suitable modifications, would seem to be more equitable. It would appear to me, however, that a change such as the following, would meet all the wants in the case, and be more generally acceptable. Instead of increasing the application fee, reduce it to $25, which might be called an examining fee, retainable by the Patent Office in every case, whether a patent be allowed or refused. Upon a favorable decision being made by the Examiner, let the applicant be notified that a patent will issue to him for his improvement upon the payment of $25 additional on or before a certain day, during which interval the Office may be engaged in recording, &c., the patent. Provision might be made for payment of the issuing fee after the day named, to meet peculiar cases, the patent, however, dated from the time specified in the original notice of its intended issue. Of course until the payment of the issuing fee, the Patent Office retain possession of the patent or stop issue, &c. Such an arrangement as this would largely increase the revenue of the Office, it would involve upon the applicant a less original cost than at present, and would thereby stimulate the poor working mechanic to apply his mind to practicable improvements connected with his trade instead of, as by increasing simply the application fee, making him careless of the advantages to be derived, or exposing him to the avariciousness of a partner of rights in prospective only and doubtful till examined. The increase of price, that is, the balance due upon the issue of the patent, the inventor will have no difficulty in meeting, without sacrificing his interest, when once he is in possession of official notice that a patent will issue to him.

Instead of the $25 alone named, it is believed that, taking into account the suppression of the present withdrawal fee when an application is rejected, $20 fee on application and $20 additional on the issue of the patent, would be found amply sufficient to meet the increased expenses of the office, and the reduction of the patent fee to the lowest figure possible till the result of the examination be made known would seem to be the fairest and least burdensome to the many, and would act as a stimulant to invention generally.

It will be apparent to you that the foregoing proposition, in its general tenor borrows largely from the 1853 Report of our present able Commissioner. A. G.

Washington, D. C., Dec. 11th, 1854.

[This is a subject with which our correspondent is well acquainted, and his suggestions deserve respect and attention; still we are of opinion that the plan suggested in last weeks SCIENTIFIC AMERICAN is the best.

**Condensers of Steam Engines.**

Two kinds of condensers are employed on steam engines, the one called the "inside" and the other the "surface condenser." In the former the escape steam from the cylinder meets a jet of cold water, and is instantaneously condensed into its original condition—water; in the latter the condensing water does not come in contact with the exhaust steam; it only cools the condenser from the outside, thereby reducing the temperature of the steam, and in this manner brings it back to its former watery state. The outside condenser is the oldest, but few of them are employed, owing to their sluggishness of action—the inside kind being discovered by accident to be about eight times faster in its operation. Were it not for this superior quality of the inside condensers, the surface kind would be far preferable, as the condensed steam, which is pure water, could be employed over and over again in the boilers, and thus avoid all incrustations. Hitherto, however, all attempts to make the surface condenser as economical in all its operations as the inside condenser, have failed, and yet it is a positive fact, that to this kind of condenser alone have inventors devoted their thoughts in the way of improving it, as if the inside condenser had reached the standard of perfection. Louis Bollman, of this city, however, has taken this condenser under his charge, and has applied for a patent on some improvements, which consist of three separate parts. The nature of the first consists in a certain method of regulating the injection of cold water, to prevent the use of a surplus quantity, and produce the vacuum as quick as it is possible to do so, so as to obtain its full effect as near as possible during the whole stroke of the piston.

The second part consists in providing certain means of stopping the injection of the water into the condenser, or diminishing the quantity, when by any accident the air pump or its connections are disabled, so as to prevent the condenser being flooded.

The third part consists in heating to a much higher temperature than the water which is drawn from the condenser, a sufficient quantity of water to feed the boiler, by means of injecting and exposing the said water to the action of the exhaust steam, when it first leaves the cylinder, and then passing it into a receiver for supplying the boiler, and to preserve all the heat it has received. Measures have been taken to secure a patent.

**Improved Hog Pen.**

J. R. Hoffer, of Marietta, Pa., has made an improvement in the construction of hog pens, for which he has taken measures to secure a patent. He employs what he terms a guard-plate, running longitudinally the whole length of the feeding trough which is so arranged as to prevent the hogs from getting their feet into the feeding trough. The hoggish habit of swine to put their feet in their own food, is remedied by this improvement, so that when a number of them are feeding from the same trough, they will have more room, and will not be so ready to quarrel and fight as when feeding out of the common trough.

**Cumberland's Metal Bending Machine.**

In the list of patent claims published this week, we notice the grant to Wm. W. Cumberland for a metal bending machine, which was obtained through our establishment.—The invention is one of remakable ingenuity. Twelve distinct claims are required to cover its various operations. It is seldom that we find it necessary to put in so many claims on one improvement.

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### Plants Under Different Conditions.

Dr. Gladstone, F. R. S., has communicated to the London *Chemist* some interesting facts in relation to certain experiments made by him upon plants under different colored glass, and under different atmospheric conditions.

Darkness promotes a rapid and abundant growth of thin rootlets; it prevents the formation of chlorophylle, but does not interfere much with the general healthiness of the plant, nor with the production of the coloring matter of the flowers. Partial obscurity produces the same effects in a modi fied manner, but greatly facilitates the absorption of water; and the cutting off of the chemical or blue ray under such circumstances seems to make very little difference. The withdrawal of all but the caloric rays interferes with the length of the roots, and produces a badly developed plant. The pure luminous ray causes the rootlets to be few and straggling, and diminishes the absorption of water. Hyacinths were well developed under the pure chemical influence.

Experiments were made on the germination, under like influences, of wheat and peas, as samples of the two great orders of plants. The first series was made in common air, the plants being placed on damp bricks, twelve seeds of each kind being employed in each separate instance. The periods of germination, and all the circumstances that marked the growth of the plants, were carefully noted; drawings were made, and at the close of the experiment, the hight of the plants, the length of their roots, their weight, and the number of seeds that had germinated, were recorded. The effect of the same solar radiations on the two plants was extremely different. In respect to the wheat, it was found that, under the given circumstances, the absence of the chemical rays favors the first growth, and the presence of the luminous rays does not impede it. Afterwards the opposite effect takes place; the roots are retarded in their developement by the yellow ray, much more than by all the rays of the spectrum in combination. The calorific ray is on the whole the most favorable to their growth, even more so than the complete absence of all solar radiations. The shooting forth of the plume is favored also by the withdrawal of the chemical rays, especially just at first; but the full and healthy developement of leaves requires all the rays of the spectrum, the luminous being particularly necessary. In respect to peas under the given circumstances, it was found that the cutting off of the chemical rays favors the first germination of the seed; and this appears to be the principal, if not the only advantage of the darkness obtained by burying the seeds in the soil.

The developement of roots requires also the absence of the chemical ray, but is rather favored than otherwise by heat and luminosity. The first developement of the plumule also proceeds best under the same circumstances. Yet these are not the conditions which produce a healthy plant; they cause too rapid and succulent a growth; when the plant is fairly established, those radiations which are comparatively speaking devoid of light, but replete with chemical power, seem the most suited to it. The points in common between the different actions of the solar radiations on wheat and on peas are, that in both cases the cutting off of the chemical ray facilitates the process of early germination, and that both in reference to the protrusion of the radicles and the evolution of the plume; obscurity causes an unnaturally tall growth and poor developement of leaves; and the yellow ray exerts a repellent influence upon the roots, giving the wheat a downwards, and the pea-roots a lateral impulse. A comparison of the results obtained by means of the yellow, of the obscured colorless, and the obscured yellow glasses, showed that the yellow ray has a specific action in many respects, but not of the character which has sometimes been ascribed to it. The diversity of effect of the same ray upon the two plants was well exhibited by what took place under the colorless and red glasses. Under the former there grew a tall and vigorous crop of wheat-plants, with a mere matting of stunted roots from the peas, while under the latter a thick crop of green and spreading plants arose from the germinating peas, but the wheat were few and straggling, and unhealthy in appearance. Seeds of the wheat and the pea were placed in jars, containing respectively carbonic acid gas, hydrogen from which every trace of oxygen was removed by pyrogallate of potash, common air from which carbonic acid was removed by caustic alkali, and normal atmospheric air. These merely corroborated the opinion generally entertained, that oxygen is absolutely requisite for instituting the first change in the cotyledons of the seed.—Peas and wheat were also grown in oxygen gas, under the colorless and colored bell-jars. They grew, and appeared to flourish best under the chemical influences of the blue glass.

### The Alps of Europe and their Glaciers.

Prof. Guyot, of Havard University, in his lectures before the Mercantile Library Association of this city, on the above subject, has delighted large and respectable audiences by the nature of the subject, and the knowledge displayed by the lecturer.

He said he had been led to select this subject for two reasons: first, because the phenomena of the Glaciers was not known in this country; and second, because he delighted to recall the memories and associations of his native land, which such a subject could not fail to suggest.

The system of the Alps, he said, was not one continuous and unbroken chain, like our Alleghanies, but an irregular zone or circle, the base of which, at its narrowest part, was a hundred miles broad, though its altitude seldom exceeded three miles. The traveler passing along the common road that leads from France to Switzerland, when he enters between the hights of the Jura, can embrace in one view an amphitheater of mountains of nearly three hundred miles in length, the central summits of which are covered with endless snow. On passing through the transverse valleys that cut through these lofty ranges, the traveler is at once struck with the physical differences between the valley he leaves behind him and that into which he enters. In the lower valleys the bottom is scarcely twelve feet above the sea level; the heat is so intense and so concentrated that the climate during the Summer is almost tropical in its warmth. The vine grows on the sides of the hills at the enormous hight of three thousand feet above the sea level.

Visitors to Switzerland, after arriving at the limits of the forest-lands, which lie furthest down, enter upon the large pasture region, which offer a contrast the more striking from the fact that it presents an entirely new Flora. Rhododendrons, creeping willows and other shrub-like plants, are here found in innumerable varieties. Still further onward lies the region of flowers, characterized by their short stems, their brilliant hues, and the largeness of their roots. The ground is here sometimes literally covered with them; the grass is short and thick, of a beautiful emerald color, and elastic to the tread, and in the summer season presents the appearance of a magnificent green carpet, studded with the most beautiful flowers. These flowers are very hardy in their nature; the common blue forget-me-not are found to flourish 9,000 feet above the sea level. The peculiarities of the Alpine Flora are easily accounted for. The stunted stems are due to the shortness of the summer, the heat of the soil, and the coldness of the air, whilst their remarkable brilliancy of hues is attributable to the pureness of the atmosphere, and the intensity and directness of the sun's rays. The general absence of vegetation in the snowy regions is not caused by the excessive cold, but by the absence of soil. The snow line in the Alps begins about 9,000 feet above the sea level, as in the Monte Rosa, but its hight varies with the quantity of the snow and with the temperature of the entire year. The warm winds blowing on the southern slopes from Italy raise the temperature there, and plants grow on that side of the ranges which would be looked for in vain on the other. In the Pyrenees the snow line is almost invisible, owing to the greater dryness of the air; and in the Caucasian range it is much higher than in the Alps, for the same reason. The glaciers descend down to the mountains and settle at about 3,000 feet above the sea level, in the bottoms of the valleys. These glaciers are generally little less than a thousand feet in thickness, and sometimes present a surface of many miles in length. They flow down the mountains like rivers, following the windings of the valleys; but their movements seldom exceed a few feet in the year. Their motions are not uniform; the sides move less rapidly than their centers, and the tops bend downwards and advance more rapidly than the bottoms. The retardation of the lower part is accounted for by the greater friction, and the obstacles it meets with in the surface over which it passes. One of the most noticeable phenomena which a glacier presents, is the facility with which it bends itself round the obstructions it meets in its progress, passing through other masses of ice without being split up, filling up the projections and crevices of rock on either side of its course, and adapting itself to the valley in which it finally rests like so much paste. The action of the heat on the surface of the glaciers converts some of it into water, which percolates through the fissures and the body of the glacier, and finally accumulates into reservoirs in the bottom, from which in progress of time it makes its escape, and issues out in streams that, gathering greater bulk as they go onward, become large rivers, and finally make their way to the sea. The Rhone, the Rhine, the Arve, and the Ticino have their origin in glaciers, and most of the rivers which water that region, are formed in the same way. The greatest danger encountered by travelers is that of being lost in the chasms of the glaciers which are sometimes concealed by falls of snow. Not only travelers, but guides and chamois hunters, are frequently swallowed up in these abysses and never after heard of.—The mode by which cautious travelers guard against these accidents is to tie a rope to one of the guides, and at intervals along its length fasten the rest of the travelers to it, so that should one lose his footing or make a false step, he may be held up by the rest.

### London Smoke—Its use to Purify the Air.

Justice demands that the good qualities of smoke should now be shown. In an artistic view of it, smoke is undoubtedly a great evil, because it blackens our buildings, and casts shadows upon them where there should be light; nevertheless, smoke is not an unmitigated evil; in a sanitary or chemical point of view it is very beneficial, for it purifies the air when contaminated with the poisons of malaria. Smoke, in truth, is nothing more than minute flakes of carbon or charcoal. Carbon in this state is like so many atoms of sponge, ready to absorb any of the life-destroying gases with which it may come in contact. In all the busy haunts of men, or wherever men congregate together, the surrounding air is, to a certain extent, rendered pernicious by their excretions, from which invisible gaseous matter arises, such as phosphuretted and sulphuretted hydrogen, cyanogen, and ammoniacal compounds, well known by their intolerable odor. Now, the flakes of smoke—that is the carbon—absorb and retain these matters to a wonderful extent. Every hundred weight of smoke probably absorbs twenty hundred weight of the poisonous gases emanating from the sewers and from the various works where animal substances are under manipulation—by feltmongers, for instance, fat melters, bone crushers, glue makers, Prussian blue makers, &c. This accounts for the fact that London, although the most smoky, is yet the healthiest metropolis in the world. In waging war, therefore, against smoke, as an artistic evil, it is not wholly wise to dispense with it, on account of its sanitary value. Before we try to throw off the cloud-cap of London, we should shut off the sewers from all upward communication with the streets, and by an act of Parliament send the bone crushers to Salisbury Plain. As London is at present constituted, smoke is the very safeguard of the health of the population; it is unquestionably the mechanical purifier of a chemically-deteriorated atmosphere. SEPTIMUS PIESSE.

London, 1854.

[We perceive by some of our English cotemporaries, that Peter Spence, chemist at Manchester, has pointed out the evils of the new anti-smoke law, which requires all the smoke of factories, breweries, &c., to be consumed. He asserts that the smoke performed the offices described by M. Piesse, in a peculiar manner, by the absorption of the sulphuric acid generated by the combustion of the coal, which generally contains some sulphur, and that for want of the smoke, this sulphuric acid was destroying the shrubbery of gentlemens' gardens around Manchester. Smoke, therefore, has its good and bad qualities.—[ED.

### Emery Paper.

This paper is prepared by brushing it over with thin glue and dusting the emery powder over it from a sieve. The sieves employed for this purpose are of differe t degrees of fineness, according to the quality of paper desired. When emery paper is used, it is generally wrapped round a smooth slip of wood and applied to the article te be polished like a file. Emery paper cuts more smoothly when used with a little oil, but it leaves the work dull. Emery cloth differs from the paper only in the material—the thin cotton cloth to which the emery is applied.

Emery sticks are made about twelve inches long, of pine wood planed square, or rounded on one side. They are brushed over with thin glue, and daubed over with the emery powder, and the loose shaken off. When this is dry another coat of glue and emery are applied, and then left to dry thoroughly.

Razor strop emery paper is made of very fine emery and powdered glass mixed with paper pulp, and made into sheets like ordinary paper. This paper is glued on to a square piece of wood, and when rubbed with a little oil forms a strop.

### A New Silk Worm.

At the recent session of the Academy of Science of Paris, were read several interesting communications on the Cynthia, which has been for a long time past in the East Indies and in China, and has lately been naturalized in France. This insect presents important advantages. It flourishes upon leaves of the Castor Oil plant, which grows everywhere readily in moderate climates. It also feeds well upon leaves of the lettuce and willow.

The Mulberry silk-worm gives but one gen eration a year, while the Cynthia completes one in forty-three days. It is more robust. It is sick during its four moltings, which last but twenty-four hours at most. Its silk has considerable hardness and solidity. The Cynthia has these distinguishing peculiarities, viz: It creates the material from which it builds its house, and shapes its threads conical, and takes, during its constant, indefatigable and active labor of seventy-two hours to finish his house, not one moment of relaxation. It is calculated that in this work its head makes three hundred thousand movements—a little more than one every second.

### Cure for Felons.

MESSRS. EDITORS—In your last number I noticed an article on felons, wherein it is stated the skin from the inside of the shell of an egg, or the spinal marrow of an ox or a cow will cure them. I have never had occasion to try either of those, or any other remedy, and hope I never shall; but a friend of mine had the misfortune to have one on his finger, and was about to have it opened, when he was told to dip his finger into tar as hot as he could bear, and immediately roll a cloth around it; he did so, and went to bed and slept soundly all night, which had not been the case for two or three nights previous; he had no more trouble from the finger.

I have no doubt of the correctness of his statement, and think it ought to be made public. C. L.

Rockville, Ct., Dec. 8th, 1854.

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# New Inventions.

### Blind Slat Machine.

An improvement in machinery for tenoning blind slats has been made by Joel Hastings, Jas. Ramsay, and H. G. Chamberlain, of St. Johnsbury, Vt., who have applied for a patent. The improvement relates to the peculiar construction of the cutter stocks and arrangement of cutters therein, and to certain means by which the slats, when placed on a table between two cutter heads, are clamped while the cutters come into operation and are discharged after the operation. The combination and arrangement of devices to perform the operations specified, cannot well be described so as to be intelligible without figures; suffice it to say, that of the many improvements of this kind of machines, no less than five new claims are instituted for this one, each of which effects some advantage in tenoning blind slats, and articles of a similar character.

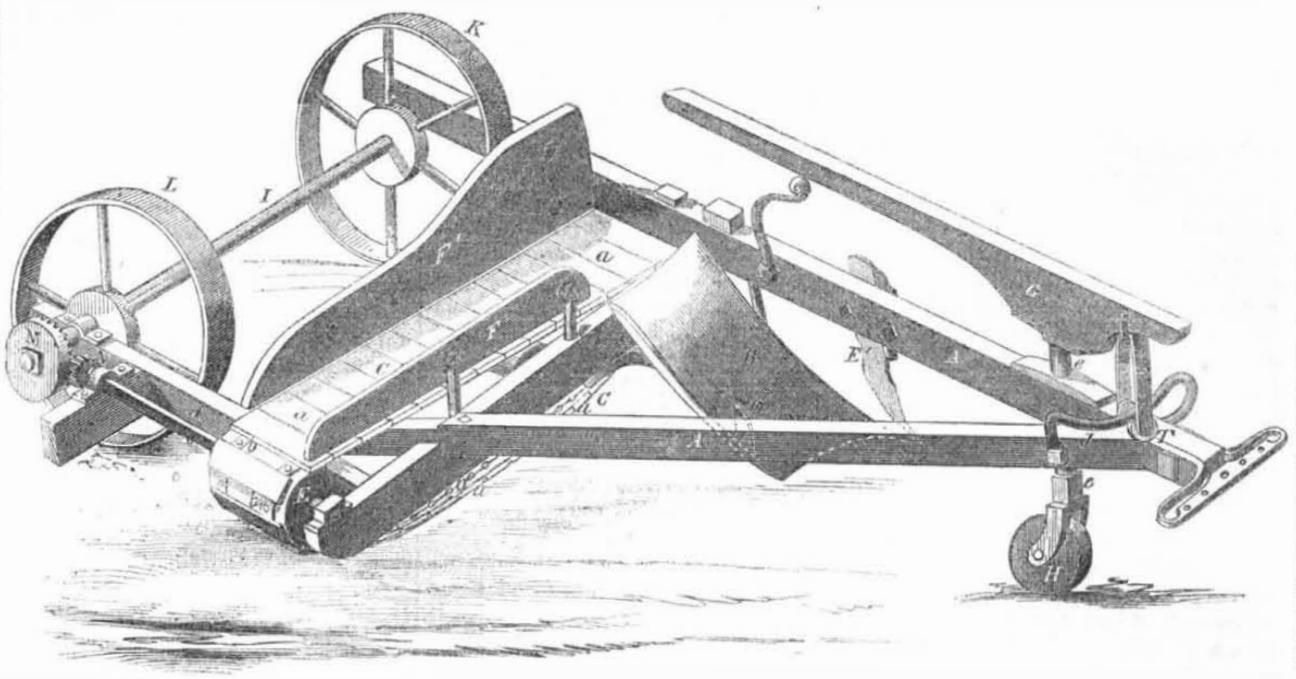
### Ditching Plow.

This figure is a perspective view of the Ditching Plow of John Lyon, to whom was granted a patent for it on the 25th of last July.

The nature of the invention consists in a new and useful arrangement of mechanism, so as to constitute a machine for throwing up embankments in forming roads and foundations for fences, and for making open drains, &c., said arrangement rendering the machine very simple, cheap, and durable, and also very perfect in its operation.

A A′ designate a triangular-shaped frame, to which all the operative mechanism is attached, as shown; B is the ditching plow, it is attached to the beam, A′, of the frame, A, in a similar manner as a common plow. Its construction is also similar to that of an ordinary plow, except the mold board, which is so shaped that instead of turning a furrow over, it merely passes under the soil, and raises it to a sufficient inclination to be deposited upon an endless conveyor, C, as fast as it is cut up. The said mold board has one of its side edges raised slightly higher than the other, so that the dirt will always clear the frame, A′, and fall upon the endless conveyor; D E are two cutters, one attached to the beam, A′, as commonly, and the other to the extremity of the share, and opposite to the land side. These cutters facilitate the entrance of the plow into the soil; C is the endless conveyor, placed behind, and at right angles to the land side of the plow. It is composed of slats, *a a*, attached to two endless chains, *b b*, as shown in the engraving, and is thus made flexible. This conveyor, is placed over a plain revolving roller at one end, and a toothed or sprocket roller, E, at the other end, and revolves on the same in a manner similar to an endless chain horse power; F F′ are two guide boards for confining the dirt on the endless conveyor—one being on the rear edge and the other on the front. The front guide, F, extends from the inner side of the plow to the center of the sprocket wheel, and F′ extends from one end of the apron to the other, and has that portion which is directly behind the plow made higher than the other part, so that the plow may not throw the earth over the back edge of the apron. By this conveyor the dirt is taken from the plow and deposited in the place desired, either for the purpose of forming a road, or foundations for fences. By thus receiving the dirt, and depositing it at right angles to the plow, a road of any length can be formed with great ease and dispatch. G is the lever which carries the guide pulley, H, that is secured in the lower end of a vertical rod, *e*, which passes loosely through the beam, A′, of the frame, A, and connects with said lever. The extreme end of the lever, G, carries a friction roller, I, which plays under and round a curved way, J, as the lever is turned in the path of a horizontal circle, and for transmitting the power of the lever to the beam, A′, in raising the plow share. By raising or lowering this lever, the plow can be adjusted so as to cut more or less deep, and by moving it horizontally, the machine can be guided up to a steep bank as the team walks along the base; K is a driving wheel, arranged fast on the revolving shaft, L, said shaft being some distance in the rear of the dirt conveyor, and revolves at right angles to the conveyor; L′ is a sustaining wheel turning loosely on the said shaft, L, near its extremity; M is a bevel wheel, placed on the extreme end of the shaft, L. This wheel gears into a pinion, N, on the shaft, O, of the sprocket roller, E, as shown in the engraving—said pinion transmits motion from the driving wheel to the endless conveyor.

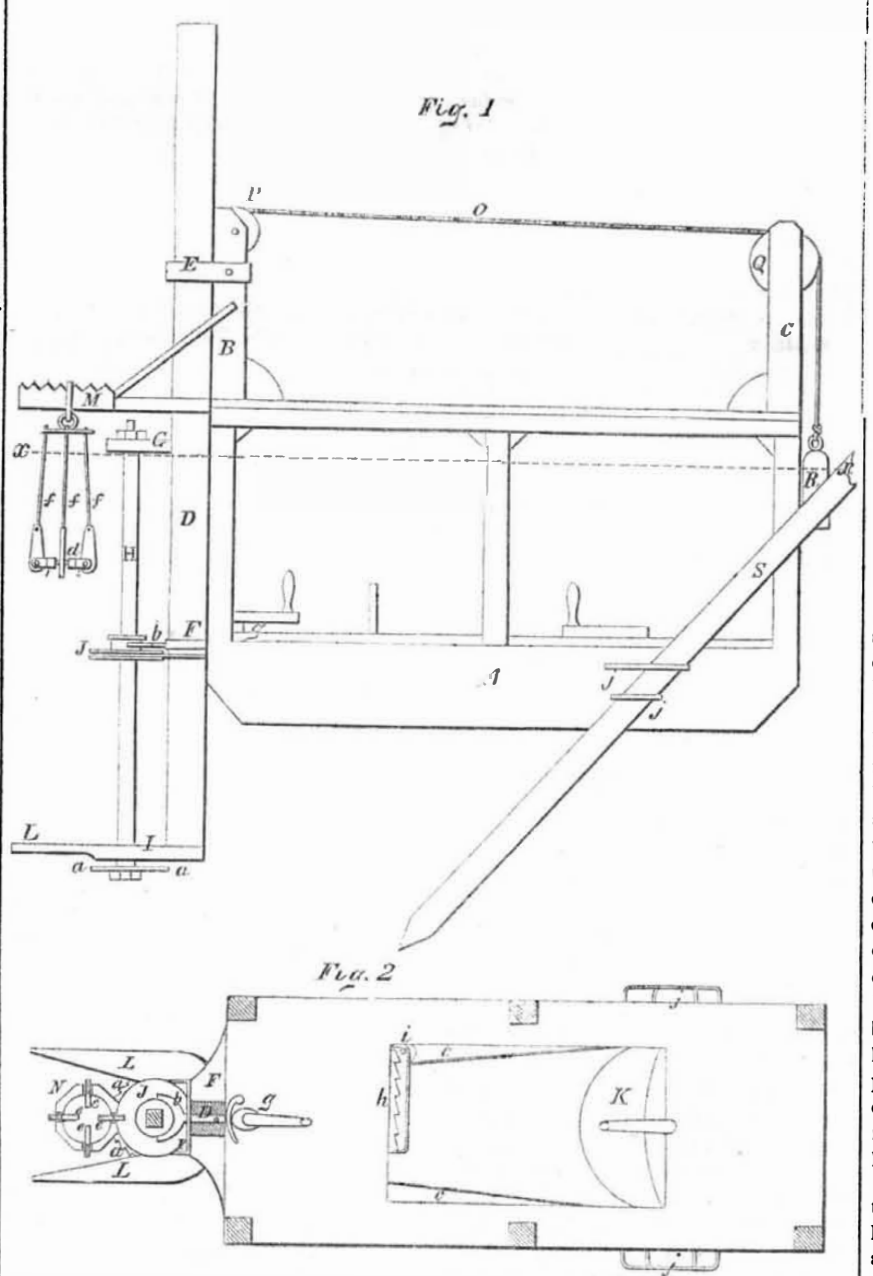
## IMPROVED DITCHING PLOW.



The operation is as follows:—As the machine advances, the plow enters the ground and raises the soil, which is forced, as the operation proceeds, upon the endless conveyor, and carried by the same as it revolves at right angles to the line of travel, and discharged at the end of the conveyor, in a continuous stream, where it is laid either to form a road or foundation for fences.

More information may be obtained by letter addressed to the proprietors, Lyon & Lewis, Farmington, Van Buren Co., Iowa.

## SAWING PILES UNDER WATER.




The accompanying engravings are views of improved machinery for sawing piles under water, for which a patent was granted to the Rev. Vincent Palen, of Portsmouth, Va., on the 31st of last October. Figure 1 is a side view of the machine, and figure 2 is a horizontal section taken at the line, *x x*.

The nature of the invention relates to the arrangement of the guides and saw on the same sliding frame, so that the guides will bring up and steady the saw against the pile to be sawed off, and the saw shaft have a bearing at each of its ends to prevent the saw from cramping or buckling in its kerf.

Various machines for sawing off piles under water have been essayed, but from some radical defect in their operation, have failed; and in some instances, in the construction of docks or coffer dams, the immense labor of drawing the piles had to be resorted to.

The entire apparatus may be arranged on a hull or float, A, on which are substantially arranged two uprights, B C. In the bow of the float is arranged the sliding frame, D, supported to the upright, B, at top by a strap, E, passing around it and the upright and to the hull by the guide piece, F. An arm, G, projects from said sliding frame, which furnishes a support for the upper end of the saw shaft, H, the lower end of said saw shaft being supported in the piece, I, in close proximity to the saw, *a*, which enables the saw to run in its kerf without cramping. The saw shaft is square, and passes through a similar square hole in the pulley, J, said pulley being retained in its vertical position by the forked arm, *b*, secured to the hull. The saw shaft and saw may be driven by an endless belt, *c*, passing around a pulley or drum, K, and around the pulley, J, and may be driven by hand or any other power. To the lower end of the sliding frame, D, is attached the guides or guide pieces, L, which embrace the pile and guide, and steady the saw whilst cutting. On an arm, M, immediately over the point in which the pile is held in the guides, is hung by block and tackle or other means a clutch, N, which is let down over the head of the pile sufficiently far to clutch said head, when it is drawn back by the block and tackle, and which both aids to hold up the float to the pile, and also to raise up the top of the pile as it is sawn, to give the saw free play in its kerf. The clutch is constructed as follows:—*d* is the clutch head, which may be made of segments or solid, and in said head are placed a series of L-shaped dogs, pivoted at the angles, 1 2. When the clutch is lowered over the pile head, the points of the dogs, *e e*, (in dotted lines in figure 2) raise up and slip over the pile. When the clutch is raised by the cords or chains, *f*, the points take into the pile and firmly hold therein for the purpose before alluded to.

The sliding frame has a cord or chain attached to it which passes over the pulleys, P Q, and terminates in a weight, R, for balancing said frame. When the frame is lowered to the proper place, it is held by an eccentric clamp, *g*, bearing against it; *h* is a rack for holding the pawl, *i*, which strains up or loosens the belt, *c*, as may be desired; S is a tug, there being one on each side, passing through staples, *j*, to aid in holding the float up to the work.

More information respecting this improvement may be obtained by letter addressed to Mr. Palen, at Portsmouth, Va.

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# Scientific American.

NEW YORK, DECEMBER 23, 1854.


### Light and Color.

The great Author of the Universe—He who said, "Let there be light, and the light was," has employed colors for adorning the various productions of his power and wisdom, and for giving pleasure to his more intelligent creatures. Earth and man were expressly created for one another, and a benificent God has caused the general aspect of the world around us to be in harmony with our physical and mental constitution. The heart swells with emotion in gazing upon the crimson sky of sunset, and the blue vault above, when the sentinel stars come out at night and look down upon us from their nightly watchtowers. The colors of field and forest are imprinted with the signet mark of their Author, and the soul of man made in that Maker's image, drinks in pleasure in beholding them. The red bird, dancing from bush to bush, and the butterfly from flower to flower, charm us with the beauty of their plumage; and the flowers themselves, from the modest daisy to the stately dahlia, thrill us with delight. How pungent the truth "Man shall not live by bread alone." Music charms the soul through the sense of the ear; sweet perfumes through the sense of smell, and colors through the sense of sight. In all ages, man in every rank and condition of life has endeavored to imitate nature in her profusion of beauty, and from this passion the art of dyeing originated. Strange as it may appear, however, (and this shows the peculiar relationship of the immaterial within, with the universe without,) colors have no material existence; "What," one may say, "has the rose no color, and is the purple of the violet a delusion?" It is even so; color does not exist in these objects, but in the light which is reflected from them.—By examining any object through a glass prism, it will be found that it appears apparreled in the most gorgeous colors. Every leaf of a tree or shrub, green though it may be to the naked eye, then appears clothed in azure, scarlet, and gold. Color exists (if a quality may be said to have an existence) in light. A beam of light is composed of three differently colored rays, red blue, and yellow. According to Newton, a beam of light contained seven colors, and this theory was entertained by philosophers until about 1823, but not by practical dyers, who knew better. Red, blue, and yellow are now called "the primary colors," and all others are a mixture of these three, or any two of them, in different proportions. The celebrated Euler is the author of the true theory of colors.—Rejecting Newton's views, he conceived light to be propagated like sound, by a vibratory motion, and that "the different degrees of velocity with which those vibrations successively reached the organs of vision, occasioned the sensations or perceptions of the different colors." We have quoted these words from a volume of Dr. Bancroft, published in London in 1794, sixty years ago. Bancroft is the earliest English writer on dyeing with which we are acquainted; he rejected Euler's theory for Newton's, as did all subsequent writers until within a very few years. The great discoveries which have recently been made in light confirm the deductions of Euler, and his theory is now embraced by the most scientific men of the day. It is now known to men of science, that every part of nature is in a state of molecular motion, so subtle as in most cases to defy ocular scrutiny, yet indubitably revealing itself by its effects. It is only when those vibrations (like sound) grow strong and frequent, that they become perceptible to the senses in the form of light and heat. The spectrum (the colors of a ray of light decomposed by a prism of glass) appears, on a casual examination, to be merely a series of hues, beginning with red, brightening into yellow, and fading away from violet into darkness. But when examined scientifically, it is found that those hues are produced by a series of vibrations of the broken beams of light, the strongest and slowest of which are least refracted, and form red; and the feeblest and most refracted the deep blue.—The human eye must be so constructed as to appreciate these vibrations of light, or it will be color-blind, as was the famous Dr. Dalton, author of the atomic theory, who could not, by its color, distinguish a cherry from the green leaf of the tree. It is the same with some persons respecting music, their ears cannot appreciate either tune or harmony. A ray of light has different properties. The red ray is termed the *calorific*, the yellow the *luminous*, and the blue the *chemical* or *actinic*. The red ray developes heat, the blue chemical, and the yellow neutral qualities, of which the daguerreotypist takes advantage, by employing yellow drapery in his room when he wants a very dark back ground for his picture, and uses blue glass when he wishes his plate to be acted upon rapidly. The rays of light also exhibit electric properties, both positive and negative, and Sir Jas. Ross, at the late meeting of the British Association for the Advancement of Science, asserted, that he had seen a beam of light in the Arctic regions make the magnet oscillate five degrees. The calorific and chemical rays of light explain the phenomena of fish and flesh meat decomposing so rapidly under the influence of moonlight, The heat rays of the sun are absorbed by the moon, while the feebler but more rapidly vibrating rays of blue are reflected, and bring to the earth a certain amount of illumination, combined with a strong chemical influence, which, in tropical climates especially, exert such an active decomposing force upon fish exposed to their influence.

By mixing the different rays—red, blue, and yellow—(which constitutes the art of coloring) as much diversity of shade is produced to the eye, as by blending the vibrations of the atmosphere in producing every variety of musical tunes. Red and blue mixed together make crimson, purple, violet, lilac and maroon, according to the proportions of the mixture. Blue and yellow form every variety of green shades. Red and yellow form scarlet, orange, salmon, buff. Black is a combination of all the three colors, and so is white; the former nullifies the vibrations of the sunbeam, the latter exhibits those vibrations unbroken in number and velocity. As light is produced by vibrations, (about which there can be no question now,) and also all the colors of the spectrum, and as these colors are electric, the conclusion is that there is a subtle medium pervading all space, according to the theory of Descartes—for to produce vibrations there must be something to vibrate.

Some of these views will be new to the most of our readers, and are intended to form a necessary introduction to a series of articles on the Art of Dyeing. We intended to have commenced these four weeks ago, but owing to some articles on another subject having been continued from week to week, until the last, we have delayed until now; after this they will be continued regularly, and be of a thorough practical character, useful for the workshop and family.

### An Abusive Cotemporary.

The *Mechanics Magazine*, London, opens a volley of its abuse against the Scientific American for appropriating, without acknowledgment, information from the "Appendix to the Specifications of English Patents for Reaping and Mowing Machines," a collated work by Bennett Woodcroft, of the English Patent Office.

In speaking of this the *Magazine* indulges in language suited to the low vulgar papers of the day. In its issue of Nov. 5th, 1853, it characterized the American people as ardent in their attachment to "a species of literary and scientific pyrotechnics," and that "all their productions go up as rockets, but most of them come down as sticks. The laudatory adjectives of our language glitter profusely on almost every page of our literature." The editor of course knew he was *falsifying* when he penned these remarks. He is generous enough, however, to add in a marginal note, "that a very sensible improvement in this respect has lately taken place in some of the American scientific journals." The Scientific American being "cited as an example." Now the editor wheels about and charges on the Scientific American with low and ungentlemanly epithets, because we did not credit Mr. Woodcroft with extracts from his compilation. If the editor had only held on to his bad passions until the close of our series on reapers, he would not have had occasion to expend so much virtuous indignation. Like Mr. Thomas' Almanac, the *Mechanics' Magazine* is a venerable, quite unpretending sheet of the "old fogy" order, not very active, but is altogether a good specimen of "learned dullness," sometimes showing its brighter perceptions by copying from the Scientific American, and generally (but not always) with proper credit. We have our eye now upon an article in a late number *stolen* from the Scientific American. The original matter in the magazine is usually supplied by correspondents, or copied from its exchanges, hence the ability of the editor is seldom brought into requisition, therefore there is no knowing what he is capable of doing, as he generally withholds the expression of his opinion (if he has any) upon scientific subjects. Since the death of Mr. Robertson, the former editor, the *Magazine* has degenerated in point of ability, and has become a mere lumber-wagon of accommodation for other men's brains. Its circulation is very obscure, and we presume from its illiberal estimate of American character, inventors and inventions, that its circulation in this country is confined to a very few exchanges. On the other hand, the Scientific American circulates very freely in Great Britain—one manufacturer in Birmingham takes twenty copies—our list comprises English Lords, besides the names of some of the best engineers and manufacturing concerns in England and Scotland. Perhaps a knowledge of these facts acts like a thorn in the Editor's side, or perhaps he is smarting under our defence of Mr. Hobbs from his unscrupulous assaults upon his reputation; not unlikely on account of his being an American citizen. A correspondent not many miles from the office of our pugnacious exchange, wrote us some time since that "they have no such valuable papers in London as the Scientific American," probably, however, he never saw the *Mechanics' Magazine*; be this as it may, we can assert without the fear of successful contradiction, that the *original editorial matter in one volume of the* Scientific American *will amount to more than the entire contents of a volume of the Magazine.* The editorial labor devoted to the two works will bear no comparison whatever, as the *Magazine* contains the smallest possible quantity.

The number of articles copied from the Scientific American into the *Magazine* would rather carry the impression that the editor esteemed it as his best exchange. The same mail which brought the *Magazine* brought also a letter from a very intelligent foreigner, in which he says: "I find in the London *Mechanics' Magazine* of the 25th a most virulent article against the Scientific American. It is nothing but a string of abusive remarks without a shadow of good grounds. The collection of reaping machines is not the work of Mr. Woodcroft, but is a public work, published by authority, through that *savan.* Mr. Woodcroft will be foremost, I am sure, in stigmatizing such gratuitously abusive language.''

Our readers will notice that we acknowledge the *original sources* from whence all our information about foreign reapers is derived by naming the publications, therefore the remarks of the *Magazine* are entirely gratuitous and impertinent.

Mr. S. H. Wales, of the Scientific American, New York, has been elected Honorary Vice-President of the London Society of Arts. This institution numbers among its members some of the most distinguished *savans* of Europe. Its honor of Vice-Presidency has seldom been conferred upon an American citizen.—[N. Y. Sun.

### On the Patentability and the Patenting of Inventions.

For the information and encouragement of inventors we would repeat what we have more than once before had occasion to remark, viz:—That we are always ready to advise them, *free of charge*, in regard to the novelty and patentability of their discoveries. In applying for our opinion on such subjects, they should send either a model or a rough pen-and-ink sketch of the invention, so that we may form a clear idea of the same. We will then reply to their inquiries either by letter or through the column in our paper devoted "to Correspondents."

Those who have already matured inventions which they desire to secure by patent, are informed that they can have the business well and promptly done at the Scientific American office, on moderate terms. There are several reasons why we think that intending patentees will invariably promote their own interests by having their patents prepared through our establishment.

First, An experience of many years in the preparation of these important documents enables us to do the work properly, and to secure the inventor's rights as fully as they *can be* protected. Many patents have been wholly lost, and others rendered worthless, owing to the inexperience of the parties to whom the drawing up of the original claims and other papers were confided.

Second, All patents prepared by us are done under our immediate personal supervision; every case receives the most careful attention; nothing is slighted.

Third, The large number of patents granted every week to individuals who have entrusted to us the management of their cases, proves that we are more likely to succeed in procuring the issue of a patent than any other agency in the country.

Fourth, Brief editorial accounts of nearly all inventions patented through our agency are published at the proper time in the Scientific American, which is read by not less than 100,000 persons every week.

Fifth, We are not engaged in the business of selling patents, and therefore have no personal interests of that kind to promote. Our patrons may always rely upon being dealt with impartially, promptly, and honestly.

### Fine Writing.

We have received four specimens of writing from T. B. McDowell, of Boliver, Tennessee, which for beauty and fineness surpass anything we have ever seen. On three cards are written the Lord's Prayer, enclosed in a circle of only one-eighth of an inch in diameter, and on the other card, the "Declaration of Independence" is written in less space than a circle of one inch diameter.—The letters are distinct, neat, and clear; it requires a magnifying glass to read them. Our readers will form some opinion of Mr. McDowell's skill as a penman, when we state, that his Declaration of Independence, with all the signers names attached, which he has embraced in a circle of one inch in diameter, would occupy more than two columns of printed matter in the Scientific American.

### $570 IN PRIZES.

The Publishers of the Scientific American offer the following Cash Prizes for the fourteen largest lists of subscribers sent in by the 1st of January, 1855.

**$100 will be given for the largest list,**
**$75 for the 2nd, $35 for the 8th,**
**$65 for the 3rd, $30 for the 9th,**
**$55 for the 4th, $25 for the 10th,**
**$50 for the 5th, $20 for the 11th,**
**$45 for the 6th, $15 for the 12th,**
**$40 for the 7th, $10 for the 13th,**
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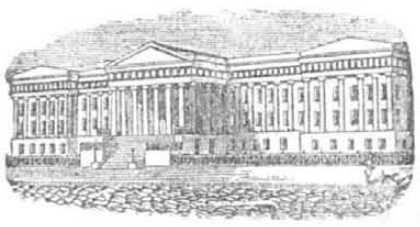

[Reported Officially for the Scientific American.]

## LIST OF PATENT CLAIMS

**Issued from the United States Patent Office.**

**FOR THE WEEK ENDING DECEMBER 12, 1854.**

POLYGRAPHS—Nathan Ames, of Saugus, Mass. : I claim the horizontal parallel wires, B B', and D D', and the connecting wire, C, constructed and combined, substantially as described, so that by means of themselves, the penholder, E E, may be supported and guided with as little complexity, weight, friction, and liability of getting out of repair, as possible, the simple weight of the wires and penholder always preventing the joints from wearing loose, however much the instrument is used, and the elasticity of the wires, D D', always supporting the pens at a small but equal distance from the surface of the paper whenever they are not pressed down by the operator in writing, copying, or drawing.

POLYGRAPH—Nathan Ames, of Saugus, Mass. : I do not claim, in this instrument, the supporting and guiding wires, G G' H and I I', these being included in as parts of another patent granted to me.

But I claim, first, arranging two or more tables, one above the other, for the purpose of writing simultaneously on two or more sheets of paper, as described.

Second, arranging two or more pens, one above the other, in the end of a forked penholder, constructed substantially as set forth, consisting of as many prongs as there are tables, all the pens being moved and guided simultaneously in the same or in any direction, as described.

Third, arranging one inkstand above another, as described, in order that all the pens in the different prongs may be supplied with ink at the same time.

Lastly, the method, as defined, of confining the sheets of paper or the leaf of a blank book to the under table or tables.

OPERATING LOOMS BY ELECTRICITY——Gaetan Bonelli, of Turin, Sardinia. Patented in France Aug. 15, 1853 : I desire to have it well understood that I do not confine myself in the exact details of the description and drawings.

But I claim, first, the application of electricity or of electro-magnets to power looms, in order to raise or keep in an elevated state the hooks and healds, in the required order to form the design or pattern of fashioned stuffs, such as shawls, carpets, ribbons, &c., as described.

Second, the various means of making such designs on metallic surfaces by means of an insulating material, and the use for this purpose of varnish, of weavings, or paper painted or colored with metallic substances, of paper cut out, or pinked, or pierced.

HANGING CARRIAGE BODIES—B. F. Brown, of Dorchester, Mass. : I claim the combination of the springs and perches, arranged substantially as described, for sustaining the weight of the carriage body, and for relieving the said carriage body from sudden jolts, the combined action of the C-springs and perches, being such as to give an easy and elastic motion to the carriage body.

I claim the combination of the C-spring perches and thorough braces, the said thorough brace operating to give an easy motion to the carriage body, and preventing the swaying of the said carriage body from twisting or bending the C-springs, as set forth.

OSCILLATING STEAM ENGINES—Matthew Cridge and Samuel Wadsworth, of Pittsburg, Pa. : We do not claim the side pipe, as such has been used before in different shapes.

But we claim the arrangement of adjusting the side pipe of an oscillating engine by means of set screws, M, or any other means being for the same purpose, to act directly on the places where the steam re-acts on, viz., opposite the steam and escape openings in the surfaces, c and d, of the side pipe, and of resisting at the same time the re-acting power of the steam against the side of the cylinder by means of a counter set screw, N, or by any other means being for the same purpose ; the set screws, M, and counter set screw, N, forming a complete system of regulation for the purpose of keeping the surfaces between cylinder and side pipe steam tight, and adjusting the position of the cylinder, substantially as described.

MACHINES FOR BENDING METAL—William W. Cumberland, of Newark, N. J. Patented in England, Jan. 23rd, 1854 : I claim, first, the arrangement and connection in any manner, substantially as described, of the parts A B and C, termed respectively the bed, the down-hold, and the die-piece, and employed, the two former for holding the slat or piece of metal to be operated upon, and the latter for holding the die or dies, whereby the resistance of the slat or piece operated upon, to the bending or forming operation, causes it to transmit the power necessary to produce the pressure for holding it, as set forth.

Second, furnishing the down-hold or movable holding part, B, with a catch, W, which is so formed and arranged that it may be brought to a suitable position to catch on the die-piece, or on an arm attached thereto, when the die piece has moved back to a certain distance after the die has done its work, and thereby attach the down-hold to the die-piece, so that the former is raised by the movement of the latter, and thus caused to liberate the slat or other article which it has held in place.

Third, controlling the operation of the catch, W, so that it shall only catch the die-piece during every second return movement, or after it has made as many movements as may be necessary to produce the required form on the slat or other article by means of the lifter wheel, Z, ratchet, Z', and click-piece, z', all arranged and operating as described.

Fourth, constructing the back part of the face of the down-hold with a series of projections and recesses, and the front, r, of the die-piece above the die with similar projections and recesses, fitting to the projections and recesses on the down-hold, as described for the purpose of affording support to the upper side of the slat or piece on the side opposite the bend, during the bending operation, and allowing the die to work up as close as is necessary to the edge of the bed and down-hold.

Fifth, the employment of two or more dies, e1 e2, of different depth or of different form, arranged in or upon a roll, E, which has such movements on its axis, as described, as to bring the said dies successively into operation upon the slat, or other article, whereby a form requiring two or more distinct operations of the die to produce it, is produced on the slat or article without releasing it.

Sixth, attaching the back hold plate, D, which regulates the position of the slats on the bed, to the bed, by springs, K K, of any suitable description, for the purpose of allowing it to yield to the movement which the slat is caused to receive upon the bed by the tightening of the down hold, and for allowing the movement which is given to it for the purpose of throwing out the slat.

Seventh, furnishing the back hold plate, D, with a flap piece, D', hinged to it so as to be thrown down on the bed at pleasure, for the purpose of regulating the position of the slat, when the second scroll is to be formed, and compensating for the reduced width of the slat caused by the bending of the first scroll, as described.

Eighth, giving to the back hold plates, D and D', the necessary movement to expel the slat or piece after the scroll or other form is produced on either edge thereof, and suddenly leaving it free to be returned by the action of the springs, K K, to the proper position to adjust a new slat or piece upon the bed, by connecting it with a lever, F F', which is furnished with a springing piece, I, which is operated upon, as described, by pieces, I I', attached to the down hold every time the latter moves to liberate a slat or piece.

Ninth, the arrangement of the dies relatively to the arc described by the axis of the die roll, as described, whereby the resistance of the metal to the bending or forming operations of the two dies is made to act in such a direction as to cause the die to have a tendency to turn on its axis in the proper direction to bring the projecting piece, 17, into contact with the stop, 18 or 19, as may be required.

Tenth, the method described of turning the die roll, E, back and forth, to change the positions of the dies, e' e2, by means of catches, X X, which are attached to the bed, and stand in such positions, that when the die piece swings back, they catch on studs, Y Y', attached to the die roll at a distance from its axis.

Eleventh, attaching the studs, Y Y', to a pair of levers, O O', which are attached to the die roll, and are so formed and arranged and controlled by a spring, 33, that when the studs are caught by catches, X X', which turn the die roll on its axis, the levers are caused to act upon a double pawl, J, which is so arranged as to fall behind either of two projecting pieces, 17, 32, on the die roll, for the purpose of holding it against one of two fixed stops, 18, 19, and to move the said pawl so as to release one of the projecting pieces and fall behind the other, and thus release the die roll from the position in which one die is operative, and secure it, after it has been moved to the position in which the other die is operative, as fully described.

Twelve, the arrangement of the preparatory dies, P P', relatively to the bed, the down hold and the die piece, which carries the bending dies, as described, whereby the attendant is enabled to conduct the operations of the preparatory dies upon one slat, and the bending dies upon another slat, at the same time.

MACHINES FOR CRUSHING AND GRINDING MINERALS AND OTHER SUBSTANCES—T. O. Cutler, of New York City : I do not wish to be understood as now claiming the invention of distributing and holding the substances to be crushed and ground against the periphery of a rim or shell by centrifugal force, or this broadly in combination with a body or bodies rolling against such substances, as this is fully described in the letters patent before named.

But I claim combining with the rotating pan or shell having a rim against which the substance to be crushed or ground is distributed and held by centrifugal force, substantially as described, one or more wheels with round or beveled treads and turning on axes radiating or nearly so from the axis of the fan or shell, and whose planes of motion are tangent to a circle of less diameter than the rim of the pan, substantially as and for the purpose specified.

THROSTLES FOR SPINNING COTTON—Charles Danforth, of Paterson, N. J. : I claim connecting together the spindle rails from side to side of the frame in two or more sections connecting the guards and guide wire boards with the spindle rails, so that they will traverse with them, and constructing and arranging the traverse movement so that the different sections will counterbalance each other, essentially as described.

DESTROYING VERMIN—G. W. French and Wm. Wagstaff, of Cambridge, Mass. : We disclaim the employment of heated air alone, or of a jet of steam from a boiler under pressure ; but we claim the use of a current of steam issuing from a boiler under high pressure, in such manner as to mix with a current of heated air, and to drive the mixture forcibly forward in a somewhat confined state until it comes in contact with furniture, fabrics, &c., in order rapidly to heat the surfaces and crevices, for the purpose of destroying vermin, without injury to either cabinet ware, woolen, or other fabrics, substantially as set forth.

HOES—Moses Gates, of Gallipolis, Ohio : I claim the construction of the tube or socket with a shoulder on the end to be attached to the blade or plate, the attachment of the same to the plate by drawing it through the plate and hammering down the end of the tube so as to form a burr or rivet head on the outside of the plate, and the more firm attachment of the tube or socket to the plate by soldering or brazing, as described.

COFFINS—John Good, of Philadelphia, Pa. : I am aware that water valves and joints are in common use, and therefore do not claim these devices separately.

But I claim the collar, n, the reservoirs, G and L, in connection with the pipes, H I and K, the various parts being arranged and connected as set forth, and acting in the manner, and for the purposes specified.

HARROWS—E. L. Hager, of Frankfort, N. Y. ; I claim the manner, as described, of securing the harrow teeth to the frame, A, in combination with the means employed for making said teeth capable of being adjusted from a vertical to an oblique position, and of being set to any depth desired, for the purpose set forth.

ANGLER'S COMBINED FLOAT AND SINKER—J. W. Hoard, of Providence, R. I. : I claim making the sinker hollow, and providing one end thereof with an aperture, through which the interior may be loaded and unloaded, in the manner and for the purposes substantially as set forth.

SECURING CARPETS TO FLOORS—Enoch Jackson, of Portland, Conn. : I claim the hook, hooks, or claws on the loop by which said apparatus, as set forth, may be attached to, when fastening carpets to floors, or detached from, when taking them up, at pleasure.

HUB BANDS FOR CARRIAGES—J. Jenkins and J. R. Cooke, of Winsted, Conn. : We claim the combination of the serrated projections, b b, with the inclined planes, a a, and one or two spring clicks or dogs, e e, when the whole is constructed, arranged, combined, and made to operate substantially as described.

FLYERS—E. C. Johnson, of Lowell, Mass. : I claim the arrangement and combination of the pin, G, fastened in the end of the arm, C, of the flyer by the set screw, H, in connection with the spiral spring, F, in such a manner as to render the presser easily adjustible, and so that both the spring and pin shall be contained within the barrel of the presser, substantially as described.

CUT-OFF REGULATORS FOR STEAM ENGINES—H. A. Luttgens, of Paterson, N. J. : I claim operating the cut-off eccentric, which is fitted to run freely on its shaft by means of friction produced by the eccentric strap, E, and the friction produced by a brake strap upon the brake pulley, K, in connection with the gearing, J H M, and segment, N, the spindle connecting the pinion, M, and spur wheel, H, revolving freely in a bearing stationary upon and parallel to the crank shaft, the mechanism receiving its impulse from the revolution of the latter, the whole operating substantially as described, and to the effect that any friction produced by the brake strap upon the brake pulley, greater or less er than necessary to counterbalance the friction of the eccentric strap, will cause the eccentric to turn upon the shaft, and and alter its angular position to the crank, the brake strap being operated upon by a steam engine governor of common construction.

FEED MOTION FOR SAWING LIGHT LUMBER—J. F. Lovecraft, of Rochester, N. Y. : I claim the feed motion for saw mills described, and shown, said feed motion consisting of two or more small saws, D' D2, so united together that the teeth of one come opposite the spaces of the other, and so arranged that they can be adjusted so as to be caused to enter the board to a greater or less depth, as desired, or to be entirely out of the way when the table is being used for a different purpose, substantially as described.

SEWING MACHINES—William Lyon, of Newark, N. J. : I claim, first, the arrangement of the feeding pieces, that is to say, the rod, H, suspended at one end by an universal joint, so that the unattached end may be permitted to play vertically, and also to rock or vibrate as an axis, and having on said unattached end a feeding finger, i, and arm, k, in combination with the governing studs, m n, upon the wheel, E, as set forth.

Secondly, the clamp, G, in combination with the needle bar, F, and working in connection with the feeding finger, as described.

PROPULSION OF VESSELS—Henry H. Olds, of New Haven, Conn. : I claim, first, the combination of the extension guide bars, E E, with the frame, C, propellers, B B, shifting bars, H H, and cross heads, G G, in the manner and for the purposes as set forth.

Second, the combination of the shifting bars, H H, catch, I, and shifting float, K, with the frame, C, in the manner and for the purposes substantially as set forth.

DOCK HOLDERS FOR HORSES—E. H. Penfield, of Middletown, Conn. : My invention consists in fitting a pad upon the rump of the horse, near the tail which may be sustained in its proper position by a crupper passing under the tail, and a strap going forward to be attached to a surcingle or a breast girt, according to convenience, to the rear end of which I attach by a joint, a spring, and hold it in its desired position by a ratchet and ratchet wheel, and attach this spring to the horses rail by straps passing round both at suitable distances.

I claim the apparatus set forth, when constructed, arranged, and made to operate substantially as described.

GOLD COLLECTOR—James Perry, of New York, N. Y. : I claim collecting the matter containing gold and other precious substances, in the beds of rivers, ravines, gulches, &c., carried along by the force of the stream, by placing in the bottom of such stream a box or other vessel with a perforated plate at top, and an inclined bottom discharging into a receiving trunk or equivalent therefor, substantially as described, so that the particles that pass through the holes in being washed over with the debris by the force of the stream, will gradually descend on the inclined bottom, and be discharged into the trunk, whilst the lighter substances floating will escape through the holes in the top plate, as set forth.

I also claim making the holes in the top plate of such an apparatus larger towards the rear end, as described, in combination with the compartments formed by the inclined partition, dividing the inside into compartments with inclined bottoms leading to the trunk, substantially as described.

And I also claim in combination with an apparatus substantially such as specified, the employment of a tap screen composed of bars, substantially as specified, to protect the perforated plate from the injurious action of large masses passing over it, and to aid in keeping the holes in the said perforated plate from being clogged, as set forth.

And I also claim the pocket at the lower end of the apparatus in which are collected the precious substances that pass over the perforations in the top plate, when this is combined with the said perforated plate, and the compartments and trunk below it, substantially as specified, and for the purpose set forth.

And finally, I claim the vertical trunk or equivalent receptacles, substantially as specified, and with or without an elevation, in combination with the horizontal trunk, and the compartments below the perforated plate, substantially as specified, whereby the substances collected in the apparatus can be drawn therefrom without removing the apparatus from its location, as set forth.

CHEESE VATS—Henry A. Roe, of West Andover, Ohio : I do not claim to be the inventor of applying hot water or steam for heating purposes.

But I claim the combination of the boiler, I, pipes, O O, and P, with the chamber, C, funnel, H, with the vat, A, connected with the frame, B, arranged substantially as described and applied to the purpose set forth.

HYGROMETRIC REGULATOR FOR HOT WATER APPARATUS.—Joel H. Rose, of New York, N. Y. : I claim the regulating the hygrometric condition of the air in apartments by opening or closing the valves, E E, in the pipes, C D, by the balance lever, G, its action being self-adjusting through the excess or diminution of vapor imparted to the equipoise, H, irrespective of the material of which said equipoise is constructed.

LOOMS—George Roth, of New York City : I claim suspending the griff frame and the neck board wholly or in part from opposite arms of levers, h h, on a rock shaft, E, or what is equivalent, on cams, p q, on rotary shafts, o o, in such a manner that the weight or tension of those cords of the harness, which are caught by the griff frame, shall be balanced or nearly so, by the weight or tension of those which are missed by the said frame and rest on the neck board, substantially as and for the purpose set forth.

RATTAN MACHINE—Sylvanus Sawyer, of Fitchburg, Mass. I claim the combination of a mechanism for dressing the enamelled side of the strand of rattan, and a mechanism for reducing a strand to its proper thickness, as specified.

I also claim the combination of a mechanism for reducing the strand to a proper thickness, and a mechanism for reducing it to its proper width, as specified.

I also claim the combination of a movable grooved bed or roller or rollers, pressure roller or rollers, and knives for reducing a strip to the width required.

I also claim the combination and arrangement of a mechanism for reducing the enamelled surface or side of the strand or removing the joints or other protuberances therefrom, a mechanism for reducing a strand to its proper thickness, and a mechanism for reducing it to its proper width, the same being made to act together automatically, essentially as specified.

SEWING MACHINES—G. W. Stedman, of Vienna, N. J. : I claim the tube, J, receiving thread and acting in combination with the needle, substantially as described, so that each forms a series of loops, each of which loops receives one, and is received by the next one of the other series, as set forth.

SEED PLANTERS AND CULTIVATORS—D. W. Shares, of Hamden, Conn. : I do not claim in themselves expanding and contracting hoeing wings or scrapers, as these have before been used.

But I claim connecting the wings or shoes, a, to each other, and to the frame of the machine, in such manner that they are made capable of universal adjustment by hanging them so that they may be turned on extension bars or rods, e, projecting horizontally from the rear hinge, c, and uniting them together, or otherwise equivalently hanging and connecting them so that the wing or shoes may not only be expanded and contracted to vary their width apart, but may also have their depth of entry into the ground and angular set in direction of their depth varied, to suit various widths of the wings apart, and various conditions of the soil or other controlling circumstances, substantially as specified.

I further claim the arrangement of the beveling or finishing plate, r, operating in rear of the covering portions of the wings to slightly flatten the tops of the rows, and give a neat and substantial finish to them, as set forth.

MACHINERY FOR SCRAPING METALS—Jeremiah Stever, of Bristol, Conn. : I claim the arrangement of the driving shaft, the connecting rod, F, the slotted lever, G, and its fulcrum lever, in connection with the rod, O, and its rocker shaft, C, the whole being for giving the scraper the double motion, and regulating the same, essentially as specified.

PROCESSES OF TREATING THE MOTHER WATER OF SALINES—Edward Stieren, of Turrentown, Penn. : What I claim as my invention, and for which I desire to obtain letters patent, is the process for treating the bitter water of such of the salines of the United States, for the purpose of obtaining epsom salts (or sulphate of magnesia,) iodine, bromine, and a portion of refined table salt, using for the purpose the apparatus referred to, or any other which may be found to answer the purpose.

BORING MACHINE—Benjamin F. Taft, of South Groton Mass. : I claim the method herein described of arresting and reversing the longitudinal motions of the boring tool automatically, so as to bore the holes accurately to the required depth, and then withdraw the boring tool, substantially as described.

Also the peculiar construction of the teeth of the rack and wheel, whereby they can be suddenly and at any point during the descent of the tool, engaged to arrest the boring at the instant required, and also so that in reversing the motion of the cranks, to turn the screw point of the auger out of the wood, the rack will yield to let the teeth of the pinion slip until the screw point is withdrawn, when by reversing the motion of the cranks, the auger will be raised out of its hole.

I also claim the combination of the projection, d, on the carriage with the adjustable arm, e, and the bolts, a and b, whereby the rack is released and left free to engage with the wheel, when the boring tool has descended to the required depth.

I likewise claim the combination of the projection, s, on the carriage with the spring lever, h, and the thumb lever, g, whereby the carriage is held up when the boring tool is withdrawn from the wood, and the boring suspended ; and when it is required to resume the boring, the rack is disengaged from the wheel, and the end of the lever withdrawn from beneath the projection, to leave the carriage free to ascend.

CONDENSERS FOR STEAM ENGINES—H. Waterman, of Hudson, N. Y. : I claim the mode, as described, of forming and placing the tubes of a condenser, by the employment of collars, as described, either with or without the conical pierced tube sheet, and made at the joints air tight, by means of the india rubber packing or its equivalent, as specified.

HOT AIR FURNACE—D. P. Weeks, of Malden, Mass. : I claim the combination and arrangement of the extended flame chamber, G, leading out of the fire pot, the two sets of lateral horizontal radiator pipes, H I, the connection pipes, O P, the radiator pipe, Q, and the flue or pipe, R, connected with the fire chamber and pipe, Q, as specified.

DOOR LOCKS—Jacob Weimar, of New York City : I do not claim separately the circular tumblers, n' b', for they have been previously used ; neither do I claim the circular plates on the outer ends of the hollow shafts of the toothed wheels, e.

But I claim the employment or use of the two sets of slotted circular tumblers, n' b', toothed wheels, e, disk, d, and paws, k, m, arranged as shown, viz., one set, h', being placed upon a shaft attached to the bolt, b, and the other set, n', placed upon a shaft attached to a sliding plate, a, so that when the bolt is thrown forward both sets of tumblers will be thrown in gear with the toothed wheels, e, and thereby allowing the slots in the tumblers being moved so as to be out of line with the projections, a5, c4, the pawls, k m, preventing the wheels, e, being moved until the disk, d, is also turned or moved the proper distance, and thus preventing the lock being picked by tampering with or trying the tumblers in order to get a pressure of the bolt thereon.

DRESSING FELLOES—C. W. Wyatt, of Newburg, N. Y. : I claim, first, the method of dressing felloes, substantially as described, which consists in securing the felloe within a horizontally rotating frame, and subjecting it, the felloe, to the action of suitable cutters during said rotation, the axis of the frame, and consequently the curve of the felloe, being changeable at pleasure, as described.

Second, the combination of the cutters, M M, and stocks, L L, in the manner and for the purposes set forth.

Third, the combination of the curved rack, N, with the felloe frame, C, in the manner and for the purposes set forth.

Fourth, the combination of the spring, Q, with lever, S, and standard, T, in the manner and for the purpose set forth.

SHIPS' WINDLASSES—D. L. Winsor, of Duxbury, Mass. : I claim forming on the surface of the barrel of a windlass a series of spiral scores or grooves which operate to fleet the chain, substantially as described.

I also claim placing friction rollers on the larger and inclined portion of the windlass barrel for the purpose of aiding in fleeting the chain, as set forth.

SEED PLANTERS—John Andrews (assignors to John Andrews, N. A. Richardson, and Gardner Symmes.) of Winchester, Mass. : I claim the swinging scatterer or seed sower, D, operating substantially as described.

Second, I claim the box, r, and sieve, x, as applied to the scatterer for the purpose of separating the seeds of weeds from the grain, as set forth.

Thirdly, I claim the method set forth, of raising and lowering the scatterer by means of the screw, t, or its equivalent, for the purpose set forth.

WATER-PROOFING CLOTH—M. J. Lieberman, subject of the Emperor of Russia, at present residing in New York City : (assignor to G. S. Hanford, S. H. Hanford, and J. E. Hanford, of New York City :) I claim the process of preparing oiled muslin or other similar fabrics, by means of oils, sugar of lead, and a stove room or drying oven, substantially for the purposes and in the manner set forth.

CASTING THE SPOUTS OF TEAPOTS—Henry Tiebe and Wm. Muhle, (assignors to themselves and H. H. Homan,) of Cincinnati, Ohio : We claim confining the congelation of the metal or stock in casting, to an exact joining edge or margin, by applying a part of the mold, at a heat above the fusing point of the said stock, whether used for forming the base of the teapot spouts, as described, or otherwise.

TRUSSING YARDS TO VESSELS MASTS.—Joseph Perkins, (assignor to himself and H. P. Upton, of Salem, Mass.) : I do not claim placing the center of the fore-and-aft movements of vessels' yards nearer to the yards than to the masts, except when the so placing of this center of movements is combined with the extension of the rocker bolt or spindle through the projector or gallows brace, D, into a fixed bearing upon the mast, in the manner and for the purpose set forth.

RE-ISSUE.

SEED PLANTERS—M. & S. Pennock, of East Marlborough, Pa. : Originally patented March 12, 1841 ; re-issue No. 1 dated Oct. 30, 1849 : We do not claim the mere raising of the hopper for throwing the machine out of gear ; nor do we claim, by itself, the working of the seed drill independently of the body of the machine.

But we claim the connecting of the seed drill with the hopper, when both are worked or raised and lowered independently of the body of the machine, so that both may be thrown into and out of operation at the proper time, by one and the same movement or mechanical means, as set forth.

DESIGN.

COOKING STOVES—N. P. Richardson, of Portland, Me.

### Explosion of the Steamer Timour.

On page 27 we briefly reviewed the testimony of witnesses in the trial of C. W. McCord and J. R. Scott, engineers of the steamer *Timour No.* 2, the boilers of which exploded on the 2nd of August last, near Jefferson, on the Missouri River. That examination was held before the U. S. Commissioner—B. F. Hickman—for the Missouri District, and the conclusion arrived at from the testimony was that "the explosion was caused by some sudden and unaccountable rapid generation of steam."

Since that examination was had, the Steamboat Inspectors under the new law, Jas. H. McCord and H. Singleton have also had an independent examination of witnesses, and have come to a very different and more reasonable conclusion. That conclusion is, "the explosion was caused by a scarcity of water in the boilers," and they have revoked the license of the second engineer, who was on watch at the time of the catastrophe. These two Inspectors scout the idea of explosions being caused by a sudden accumulation of steam from some unknown cause, and their examination had for one of its objects the disabuse of the public mind respecting the trial before the Commissioner, as it "justified a belief in steam being an uncontrollable agent which might develop its power of destruction in spite of the greatest prudence of the most competent engineer." We have quoted these words from the report, and must say that it places the question on its proper basis. In the laboratory, water can be treated so that it will explode, but in a steam boiler some of the conditions necessary to effect this are never present. It is our opinion that every explosion of a steam boiler is caused either by over-pressure of steam, or want of water. The evidence taken before the Steamboat Inspectors justifies them in reporting that there was an absence of water in the boiler of the *Timour*. Were it true that explosions are sometimes attributable to unknown causes, by a sudden generation of a great quantity of steam, then it would be absurd to enact any law for the preservation of life on steamboats ; but we hold to the opinion that steam is the servant, not the master of the engineer.

### New Type Setting Machine.

George Boweryem, a practical printer of this city, proposes to construct a machine for making and setting type at one operation.—The motive power which he designs to employ is that of electro magnetism, which is to operate dies for striking out the several type by the printer touching keys, like those of a House telegraph. The type is to be struck out of lead wire. The type when struck, will run down from each die into one central tube, and drop into its proper place in a long galley, which is moved regularly forward to receive each type in line, so as to make a long line, which is to be corrected before it is made up into columns.

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## TO CORRESPONDENTS.

S. M. A.—Double flanged wheels arranged as you propose, have been suggested, but we are not aware of any trial. They are equivalent to grooved wheels, and are not so good as those in use. Constructing a brake so as to cause the brake chain to be wound up by the car axle is not new. See engravings, page 260 Vol. 3, and page 353, Vol. 6, Sci. Am. The brakes now in common use, are thus far generally preferred. It strikes us that the present snow plow, carried in front of the locomotive, would answer all the purposes of your wedge-shaped defending car.

J. S. D., of N. Y.—There is a gain in power by the use of the crank, over the brake, but the difference is by no means as great as you suppose. When the united efforts of two men are applied by means of a pair of cranks, placed at right angles in reference to each other, on the same shaft, each man exerts a force equal to 7,350 lbs. But in pumping, by means of a brake, each man exerts a force of only 3,814 showing a gain by the use of the crank, of nearly 100 per cent. over the brake. This principle is involved in the patent granted last summer to Albin Warth, of this city, for an improvement in fire engines. He uses long horizontal pump barrels, and works the piston rods by racks, pinions, and cranks. There is nothing patentable in your plan. You labor under a very popular error in supposing that the use of a fly wheel increases the power employed to drive a machine.

J. O. P., of N. Y.—There is a great diversity of opinion as to which is the best sewing machine. We have no choice. Write to the different manufacturers and get prices and circulars.

H. V. R., of N. Y.—In Vol. 5, Sci. Am., "History of Propellers and Steam Navigation," by R. Macfarlane, a writer upon practical science, connected with this journal, you will find a piston propeller which covers the ground of your supposed invention. The idea is old and well known.

A. H. T., of N. Y.—We have no need of the numbers you speak of—we thank you for offering to send them. The Goodwin Water Wheel we are not familiar with.

H. P. R., of Va.—Your improvement in turn-tables, by supplying conical rollers, so as to enable them to traverse the circle of the table, presents no patentable device.

A. F. A., of Ct.—Guide or friction rollers for preventing vibration of circular saws is claimed in the patent of Geo. Page, 1841, under a combination for providing lateral play to the shaft or journal; we do not perceive any chance for a patent on your alleged improvement in saws.

W. F. T., of Miss.—The application of the common endless chain horse power to propel cars in cities, etc, could not be patented; it is an idea well known among inventors, and a patent was granted for it in England three or four years since. A patent could not be sustained for it any where.

J. H. W., of Texas—In protecting your house from lightning, you can either use iron or copper rod; if copper, it may be only one-fourth the diameter of the iron: let a rod extend above each chimney about three feet, and conduct it to the ground by the shortest direction; it is absurd to have it run on the comb of the building. The iron rods should not be less than one-fourth of an inch thick. They should be bound to the house with glass insulators or wooden cleats well varnished.

S. Y. L., of Ala.—Turpentine or linseed oil are good solvents for gum copal; sometimes both solvents are used in combination.

W. T. W., of Tex.—Robertson's sewing machine, price $40, and Ketchum's Mower and Reaper, made by Howard & Co., Buffalo, are articles that we presume will suit you.

E. T. L., of Va.—Your apparatus for uncoupling cars appears to us new and patentable.

W. M. S., of N. Y.—The paper you refer to is not sent from this office. The first five numbers are sent; remit 20 cents. We do not know where you can get the caoutchouc juice. We are not acquainted with any manufacture of wax candles. We do not sell patents, but we procure them.

B. & Co., of Ohio—Your steam gauge has long been in common use.

G. & R. H.—Your oil cup we regard as new and patentable. Send a model to this office with $30. Total expense, $55. We like the plan.

J. H. Q., of Ohio—Air springs can be arranged above and below the gate, as you describe; the idea of using them is not patentable. If your mechanical arrangement is new, it could be patented; we do not see how you would gain anything by the use of the springs.

B. F. S., of Tenn.—You will have to excuse us from following out your problem. If you desire to know whether your improvement is of practical utility, lay aside your theories, and construct a working machine or model. That will tell the story better than the most learned opinion.

W. V. S. B., of N. Y—Hop poles made in the way you describe would not form the subject of a patent. You can turn 1500 broom handles per day with Alcott's lathe; price $25; it can be applied to or removed from any of the ordinary lathes at pleasure.

S. B., of N. Y.—$1,50 received—all right. The use of the word "platen" is correct.

R. H., of Mass.—One of the best means of finding customers would be to advertise constantly in the Sci. Am.; our paper circulates between 20,000 and 30,000 copies weekly, and reaches the very class you need.

S. A. K., of Va.—We can send you a copy of the claim for $1; if you wish it please write the name of the patentee more plainly. We cannot make it out from your letter. Also state the date of the patent as near as you can.

W. W. W., of Ct.—We do not remember any strip where rubber is employed. You must determine as to the advisability of applying for a patent.

T. T., of Texas—Your chances for a patent on the bee hive are slim; it is uncertain whether a grant can be had, owing to the great number of applications that have been made. We are not cognizant of any plan exactly like yours, though the same general principle is in successful use.

G. H., of Va.—The best general composition for gunpowder is admitted to be as follows:—Nitre, 100 parts; charcoal, 17·76 parts; sulphur, 15·86 pts. For special purposes the proportions of ingredients are changed, as desired: the process is too long for publication here.

J. Q. A., of Pa.—We are not aware of the existence of any patent for the mode of ventilating mill stones which you mention.

J. C. McG., of La.—There was exhibited, at the late Crystal Palace Fair, a machine for husking corn; Thomas C. Hargreaves, of Schenectady, N. Y., is the inventor; patented Oct. 4, 1853. See last Vol. Sci. Am.

J. L., of Va.—Yours of the 2nd inst., is received; we have no charge to make for the information given in our letter of the 28th Nov.

J. A. V., of Ohio—To use the weight of the car for breaking a train is not new; the same thing has frequently been prepared.

C. W. B., of N. Y.—The principle involved in the stoves referred to, may be the same, but the arrangement is probably different; it is not a matter of any particular moment.

C. F. C., of Pa.—The process referred to by you we have not seen published.

H. H., of Miss.—Several attempts have been made to construct a portable apparatus for manufacturing gas, but as yet with but little success. We do not know of any useful apparatus for the purpose that we can recommend.

D. De D., of Mass.—On page 252, Volume 4, 1849, Scientific American, you will find engravings of a brake on the principle you refer to. We could point you to several others.

E. A., of Ill.—We think a good claim on your mode of regulating the windmill could be sustained. Cost $35 in all—government fee $10, our charge $25. Can do nothing till we receive the model.

A. L., of Pa.—Your paddle wheel we regard as patentable, but we do not discover its advantages over the ordinary buckets. We presume your previous letter miscarried. We send patent laws.

M. W., of Pa.—The Maynooth Battery receives its name from having been invented by a Mr. Callahan, of Maynooth College, Ireland. We have not seen a minute description of it, but we have been told that it is composed of zinc and iron plates, and that is all the difference. Walker's work is not so good as Smee's for information respecting batteries; Watson's work cannot be obtained in this city, and we do not import any of these works per order.

C. J. B. of Pa.—The force pump has only to lift the water above the piston. We are not acquainted with any place in our country where human bodies petrify. Timber will petrify in any water impregnated with lime. The place to which you refer in Minnesota is simply a deposit of petrified animals, but the same conditions of petrifaction do not now exist there.

O. H., of Md.—It is of no consequence respecting your claims, as it relates to the guards being described as "about three inches wide at the base." The patent says "three quarters of an inch, more or less," that is any width. The writing was so faint, that the space "three inches" being placed on the line above where it says "at the base," led to the immaterial error.

J. L., of Ill.—See receipts for varnish next week.

J. C. T., of Ohio—The bark of the slippery elm would be too expensive for making paper.

J. G. L., of Ill.—Your letter has in a measure been over looked, but your statements are not clearly made. You say you have purchased 1104 cubic inches of water in one place, and in another 1104 square inches of area. We do not understand this; you have a right to dig a race and gain hight of fall.

J. R. L. of Fla.—We do not attend to negotiating the sales of inventions, but would be very glad to find you a purchaser. If any one inquires for such inventions, it will give us pleasure to refer them to you.

R. C., of Mass.—Assignments of patents must be recorded in the Patent Office at Washington, within three months after their date. It does not answer the law to have them recorded in the town clerk's office.

W. H., of Baltimore—We had almost overlooked your letter. We cannot give you the information desired about the sugar rolls. We would drive them as fast as we had the power to drive them. Circular saws are driven at the rate of 4,600 feet per minute in cutting yellow pine, according to a correspondent in Volume 8 Scientific American. It requires a twelve-horse power to drive a saw at this velocity. Reciprocating saws of two feet stroke are driven at the rate of from one hundred to two hundred strokes per minute. No person can really lay down a rate of speed suitable for all sawing machinery.

A. B., of——Parties who write to us and do not sign their names to their letters cannot expect to receive attention.

J. F. G., of Miss.—Devices for indicating the variations of the wind on a dial plate are very common. We pass one almost every morning on our way to the office. They are very convenient, but embrace nothing new or patentable.

A. H. S., of Geo.—We do not think there is much chance for a patent on your press, and as to its advantages, we cannot see anything special in this particular. It will operate as well as ordinary presses.

W. H. R., of N. Y.—The combination of pitcher and sugar bowl in the manner shown in your sketch, is new, we think, without much doubt.

R. R., of Vt.—There is nothing new in your gauge. Such gauges have been in use for many years.

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Money received on account of Patent Office business for the week ending Saturday, Dec. 16:—

E. McD., of Va., $30; C. O. W., of N. Y., $25; B. X. B., of Pa., $30; B. McC., of N. Y., $25; U. B. U., of Pa., $30; J. R. H., of Ind., $30; J. H. K., of Pa., $55: Z. H., of O., $65; W. S., of Ind., $30; C. H. B., of Mass., $30; S. C., of Canada, $55; A. A., of N. Y., $30; E. K. B., of Ct., $30; W. B., of N. Y., $30; C. T., of N. Y., $25; J. U. W., of N. Y., $55; S. N. C., of Ill., $20; J. F. M., of Pa., $55; P. G., of Mass., $55; J. D., of N. Y., $55; F. R. T., of N. Y., $59; U. W. M., of N., Y., $20; P. L. W., of Pa., $30; E. F., of Pa., $45; G. F. W., of N. Y., $35; P. L. S., of N. Y., $30 J. H. B., of Vt., $30; R. K., of Mass., $35; M. Du B., of N. Y., $15; L. H., of N. J., $25; C. G. E., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Dec. 16:—

C. De B., of London; G. N. T., of Pa.; D. R., of Pa.; C. M. C., of N. Y.; C. O. W., of N. Y.; J. H. S., of Pa.; B. F. Mc C., of N. Y.; A. S., of London; A. R. H., of Pa; H. S. F., of Pa.; L. H., of N. J.; M. Du B., of N. Y.; C. G. E., of N. Y.; S. C., of Canada; J. H., of O.; C. L., of N. Y.; E. F., of Pa., 2 cases; F. & B., of Pa.; G. F. W., of N. Y.; P. L. W., of Pa.


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**STEAM ENGINES AND BOILERS FOR SALE.** One second hand five-horse engine with tubular boiler. One second-hand two horse portable engine and boiler. THOS. PROSSER & SON, 28 Platt street, 14tf

**A. L. ARCHAMBAULT'S** Portable Steam Hoisting Engines, for loading and discharging cargoes, raising iron ore from mines, sinking shafts pile driving, &c. Also arranged for driving Portable Saw Mills. The Engine may be moved by a team on any road. Made only by the inventor, S.-E. Corner of 15th and Hamilton streets, Philadelphia, Pa. 14 4*

## American and Foreign Patent Agency.

**IMPORTANT TO INVENTORS.**—MESSRS. MUNN & CO., Publishers and Proprietors of the Scientific American, continue to prepare specifications and drawings, and attend to procuring patents for new inventions in the United States, Great Britain, France, Belgium, Holland, Austria, Spain, etc., etc. We have constantly employed under our personal supervision a competent board of Scientific Examiners, which enables us to despatch with great facility a very large amount of business. Inventors are reminded that all matter intrusted to our care are strictly confidential, and hence it is unnecessary for them to incur the expense of attending in person. They should first send us a sketch and description of the invention, and we will carefully examine it, state our opinion, and the expense of making an application, if deemed new and worthy of it. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country. Circulars of information will be sent free of postage to anyone wishing to learn the preliminary steps toward making an application.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

It is very important that trustworthy and competent agents should be employed in securing patents, as great care is necessary in the preparation of the papers, as well as integrity in taking proper care of the case until the inventor is duly invested with his legal rights. Parties intrusting their business in our hands can rely upon prompt and faithful attention. Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that the largest proportion of patents applied for in the U. S., go through our agency.

The offices of Messrs. Munn & Co.'s American and Foreign Patent Agency are at 128 Fulton Street, New York; London, No. 16 Castle st.; Paris, No. 29 Boulevard St. Martin; Brussels, No. 6 Rue D'Or.

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United States Patent Office,
Washington, Nov. 20, 1854.

**ON THE PETITION** of Franklin Ransom and Uzziah Wenman, of the city of New York, praying for the extension of a patent granted to them the 13th day of February 1841, for an improvement in "the mode of applying water to fire engines so as to render their operation more effective," for seven years from the expiration of said patent, which takes place on the 13th day of February 1854:

It is ordered that the said petition be heard at the Patent Office on Monday, the 29th of January next, at 12 o'clock M., and all persons are notified to appear and show cause if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days from the day of hearing. All testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the Office, which will be furnished on application.

The testimony in the case will be closed on the 19th of January; depositions and other papers relied upon as testimony must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Penn.; Scientific American, N. Y.; and New Hampshire Patriot, Concord, N. H., once a week for three successive weeks previous to the 29th of January next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S. Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 14 3

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United States Patent Office,
Washington, November 18, 1854.

**ON THE PETITION** of Squire Whipple, of Albany, New York, praying for the extension of a patent granted to him on the 24th April, 1841, for an improvement in "the construction of iron truss bridges," for seven years from the expiration of said patent, which takes place on the 24th day of April, 1855—

It is ordered that the said petition be heard at the Patent Office, on Monday, the 26th of March next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 16th of March: depositions, and other papers relied upon as testimony, must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Pa.; Scientific American, New York, and New Hampshire Patriot, Concord, N. H., once a week for three successive weeks previous to the 26th day of March next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 15 3

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**ENGINEERING**—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing, Faber's Water Gauge, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc

CHARLES W. COPELAND,
14 13eow Consulting Engineer, 64 Broadway

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**IRVING'S PATENT SAFETY CIRCULATING STEAM BOILER**—This is the most safe, economical, compact, and convenient boiler devised, occupying less than half the space, consuming only half the fuel, generating more steam of a better quality, and requiring less labor in management and use than any other known. The rapid and powerful circulation which it secures, prevents incrustation or scale, and preserves the internal surfaces fresh and clean. On this account it is believed to be better adapted to salt or turbid waters than any boiler extant. Its compactness, its strength, its economy of space and fuel, and its rapid generation of steam, peculiarly adapt it to the navigation of our western rivers, as well as to all stationary portable and marine purposes. The attention of all consumers of steam, of mechanics and engineers, is invited to a critical examination of its merits. Boilers of all sizes furnished on short notice. Rights negotiated and circulars obtained on application at the office of the Company. W. F. PHELPS, Sec'y Irving Boiler Company, 347 Broadway. 10 6eow*

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**CIRCULAR SAW MILLS**—The undersigned manufacture for sale Child's Patent Circular Saw Mills for cutting lumber from logs of any size, with 40 and 24 inch, to 48 and 54 inch saws. Also single mills with 36 inch to 72 inch saw. These machines are warranted capable of cutting more lumber in a given time than any other saw mills in use. H. WELLS & CO., Florence, Hampshire Co, Mass. 13 3*

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**A. B. ELY,** Counsellor at Law, 52 Washington st., Boston, will give particular attention to Patent Cases. Refers to Messrs. Munn & Co., Scientific American. 16 1y*

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8 1y* LOGAN VAIL & CO., 9 Gold st., N. Y.

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**HARRISON'S MILL, PRICE LIST, &c.**—These Mills are warranted to give satisfaction.

| Size of stone, | 20 inch | 30 inch. | 3 feet. | 4 feet. |
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| Cash price of single geared mills | $100 | $200 | $300 | $400 |
| Do. of double geared do. | $115 | $225 | $330 | $450 |
| Bush. they grind in 10 h | 50 | 150 | 225 | 350 |
| Horse power required | 1 to 4 | 6 to 12 | 12 to 18 | 50 to 30 |
| Revolutions per minute | 500 to 700 | 500 to 800 | 400 to 700 | 400 to 550 |
| Size of pulleys | 9 in. | 15 in. | 18 in. | 24 in. |
| Width of do. | 5 in. | 8 in. | 10 in. | 12 in. |
| Hight of center of pulley from the floor | 9 in. | 10 in. | 11 in. | 14 in. |
| Weight of Mills | 500 lbs | 1400 lbs. | 1800 lbs. | 300 lbs. |
| Hight of do. with hopper | 2 ft. 9 in | 2 ft. 9 in. | 4 feet. | 5 fe3t. |

The above sizes, with the latest improvements, to be had of EDWARD HARRISON, sole manufacturer, New Haven, Conn, 12 7*

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**MACHINE GROUND CIRCULAR SAWS**—(Patent applied for.) Mill men would do well to try these saws, are perfectly free from thin or thick places, can be used thinner and with less sett and run faster than any other hitherto made. All diameters and thicknesses warranted perfectly true. HENSHAW & CLEMSON, 31 Exchange street, Boston. 11 8*

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**THE FRENCH EXHIBITION**—Parties who have applied for space in the French Palace of Industry, and who do not intend to be present at the Exhibition, are recommended by the undersigned to arrange with Messrs. Gardissal & Co., No. 29 Boulevard St. Martin, Paris, who are prepared to put upon Exhibition, attend, and effect sales of articles intrusted to their care. It is a responsible concern. S. H. WALES, State Commissioner, Scientific American Office.

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**MACHINERY**—S. C. HILLS, No. 12 Platt st., N. Y. dealer in Steam Engines, Boilers, Planers, Lathes Chucks Drills, Pumps; Mortising, Tenoning, and Sash Machines Woodworth's and Daniel's Planers; Dick's Punches, Presses and Shears: Cob and Corn Mills; Harrison's Grist Mills; Johnson's Shingle Mills; Belting, Oil, &c. 7 e3w

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**BUFFALO MACHINERY DEPOT**—Terrace St. and 36 Lloyd st., Buffalo; J. W. HOOKER, Proprietor, H. C. Brown, Superintendant, offers for sale Machinists' tools of all kinds: Engine Lathes, Planers, Drills, Chucks, Boring Mills; also machinery of all kinds on hand or furnished to order. 7tf

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**1854—MICHIGAN CENTRAL R.R. LINE** D.W. WHITING, Freight Agent, and also General Forwarder, having been a practical machinist, is prepared with skill and implements to handle and ship by any line, all kinds of machinery and manufacturers' wares. Mark plainly, care D. W. WHITING, Buffalo, N. Y. 7tf

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**STAVE AND BARREL MACHINERY**—Hutchinson's Patent. This machinery which received the highest award at the Crystal Palace, is now in daily operation there. Staves, heading, &c., prepared by it are worth to the cooper 20 to 40 per cent. more than when finished in any other way. Special attention is invited to the improved Stave Jointer. Apply to C. B. HUTCHINSON & CO., Crystal Palace, or Auburn, N. Y. 13 tf

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**PATENT DRIERS**—Zinc Driers, Graining Colors, Stove Polish, Gold Size, &c., &c., 114 John street, New York. QUARTERMAN & SON, Manufacturers. 1 6m

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**NEW HAVEN MANUFACTURING COMPANY** Machinists' Tools, Iron planers and Engine Lathes of all sizes. Hand Lathes, Gear Cutters, Drills, Bolt Cutters, Chucks, &c., on hand and being built by the quantity, which enables us to sell low. For cuts giving full description and prices, address New Haven Manufacturing Co., New Haven, Conn. 13 tf

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**STATIONARY STEAM ENGINES**—The subscriber is now prepared to furnish, with or without pumps, boilers, &c., Horizontal Engines on iron bed frames, good strong, substantial, plain finished engines that will do good service, say from 4 horse, $215, to 30 horse, $1,037; they have Judson's patent valves, and will be warranted to work well. S. C. HILLS,
9 e3wtf 12 Platt st., New York.

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**HARRISON'S GRAIN MILLS**—Latest Patent.—$1000 reward offered by the patentee for their equal. A supply constantly on hand. Liberal Commissions paid to agents. For further information address New Haven Manufacturing Co., New Haven, Conn., or to S. C. HILLS, our agent, 12 Platt Street, New York. 13 tf

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**PRICES GREATLY REDUCED**—JOHN PARSHLEY, New Haven, Conn., will have 12 of his No. 2 Iron Planers finished by the 1st of January, 1855, to plane 12 feet long, 36 inches wide and 30 inches high, with down and angle feed in the cross-head, they weigh about 8,000 lbs, and are in workmanship and design equal to any planers built in New England. Price 550 dollars cash. Boxing and Shipping extra. For cuts address as above. 13 tf

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**IRON PLANERS—NEW PATTERN**—Now building, and for sale on better terms than any others in the country of same quality. Address New Haven Manufacturing Co., New Haven Conn. 11 tf

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**NORTHVILLE MACHINE WORKS**—Manufactory of Machinists Tools, consisting of Engine Lathes, Power Planers, Hand Lathes, Engine Lathe for turning chair stuff, all of the most improved patterns and quality of workmanship. Worcester, Northville, Mass., August 9, 1854. TAFT & GLEASON. 50 1y*

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**MACHINISTS TOOLS**—SHRIVER & BRO., Cumberland, Md., (on B. and O. Railroad, midway between Baltimore and the Ohio River,) manufacturers of Lathes, Iron Planers, Drills and other machinists tools
50 6m*


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# Science and Art.

### History of Reaping Machines.—No. 12.

In article No. 11, last week, the reciprocating reaper of Obed Hussey was illustrated and described. It was therein stated that it was the next patent granted after that of Wm. Manning in 1831. So far as it relates to reciprocating reapers, this is correct, but two patents were granted in the same year for rotary reapers, viz., one to R. Heath of West Newbury, Mass., in April 1833, and another to T. A. Anderson, of Tennessee, in June following. W. and T. Schnebly, of Hagerstown, Md., also obtained a patent in August of the same year, but we have not been able to learn from the proper source what were its distinctive features, but have been informed, casually, that its cutters were of the shear character, and that it had a reel like a barrel with its alternate staves removed. As none of these machines have remained with us; indeed, as not one of the great number of reapers which were patented before Hussey's, have now an existence but in name, the conclusion is, that from some fault in the principle of their construction, they failed to accomplish the great object for which they were designed. As Hussey's, therefore, is still in use, and was a successful machine from the first, it must embrace features peculiarly fitted to accomplish its work. It therefore deserves to be dwelt upon with more minuteness than any other. The inventor himself, having the greatest confidence in his claims, sent us his original patent, to examine it for ourselves, and it was from it the illustrative figure 34 (in last week's SCIENTIFIC AMERICAN) was taken. In addition to his patent, Mr. Hussey has sent us a history of his invention, and his efforts in the construction and introduction of his reaper. We will present the substance of this history, and allow Mr. Hussey to present his own claims as the inventor of the first really and continually successful machine of this class.

The first public trial in the harvest field with Hussey's reaper, took place on the 2nd of July, 1833, before the Hamilton County Agricultural Society, near Carthage, Ohio. Dr. Wallace, Secretary of the Society, gave a certificate, a copy of which is now before us, dated the 20th November of that year, in which he states he was present, saw the machine operate on a field of wheat, which it cut clean and with great rapidity, and that it established *one* point satisfactorily, namely, that it was constructed on a principle to operate. We have also the copy of a certificate of nine witnesses of this same trial, in which they state, that although the machine was not well constructed (mechanically merely,) that its performance far exceeded their expectations. In 1834 this machine was introduced into Illinois and New York, and in 1835 into Missouri, in 1837 into Pennsylvania, and in 1838 Mr. Hussey removed from Ohio to Baltimore, Md., and has continued to manufacture his reapers there up to the present time. We will now let Mr. Hussey speak for himself:—

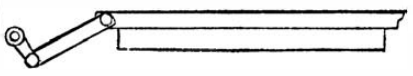
"There is no account of any successful reaper in ancient times, and it is well known that England and Scotland never produced any up to the time of the London Exhibition of all Nations in 1851; it consequently follows that the claim of priority is clearly confined to the United States. The question then is, who originated the successful reaping and mowing machine?

I do not desire to urge any unjust claim for myself, but I wish to maintain the credit which is justly due to me.

It is known to the country, and by farmers in particular, that there are at the present day several successful reaping machines, which are known by different names; but it is not generally known that all of them, without exception, embrace substantially the principle invented by me, and exhibited by myself in successful operation in the harvest field as long ago as 1833, and however surprising and unexpected this statement may appear, it is nevertheless true that there is no successful reaping and mowing machine now in use without it. Most of the reaping and mowing machines of the present day are of recent date; nearly all of them are little more than copies of my invention.

The old Roman machine seems to have been little more than a cart, backed up to the wheat. This mode of approaching the grain, was followed by the Scotch and English inventors from the remotest period in the history of reapers down to 1854. The earliest of these English and Scotch machines appear to have been constructed on the rotary principle, the cutting instruments being placed on the periphery of a large horizontal wheel, which revolved near the ground. Bell, of Scotland, at a later period used scissors. His machine presented to the grain a row of pointed blades, which operated like a series of tailors' shears, but it was soon pronounced a failure. The American Reapers woke it up from a long sleep in 1851. It was resuscitated and flourished for a brief season, took the English and Scotch prizes in 1853 by especial favor, and was again condemned at the late meeting of the Royal Agricultural Society held in Lincoln (England) the present year (1854.)

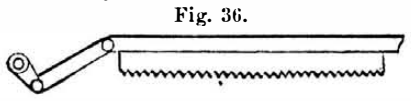
FIG. 35.



Much time, labor, and money were expended on these early inventions during many years, but there does not appear to be any record of a successful reaper until my discovery, first publicly exhibited in successful operation on the 2nd day of July, 1833.

In describing this invention it will not be necessary for me to go into particulars further than to show the general outlines, such as the horses traveling ahead of the machine on the stubble, with the cutting apparatus extending into the grain on one side, the falling back of the grain on to the platform without the assistance of a reel, and the delivery of the sheaves either behind or on the side with a hand rake by a man who rides on the machine. I pass briefly over these and come to the cutting apparatus, in which the chief merits of my invention consists.

Fig. 36.



The cutting blades are of lancet-point shape, and sharp on both sides, these are fixed side by side on an iron rod, in the position of saw teeth, and receive a vibrating motion from a crank to which the iron rod is attached, these blades project forward, from the front edge of the platform towards the grain, and play through a corresponding row of permanent iron guards or fingers, which also project forward from the front of the platform. As the machine progresses the grain or grass comes in between the stationary guards or fingers, and is cut off by the vibrating blades. The motion of the machine forward inclines the heads of the grain backwards on to the platform where the sheaves are formed.

The great point in this invention is the double finger. In combination with the vibrating blades. each finger being formed of an upper and a lower half, with sufficient space between, for the passage of the blades through them. The straw to be cut is supported both above and below the edges of the blades, and is cut off as the blades pass through the fingers by the revolution of the crank.

In conclusion I will submit the following points and leave it to the judgment of the public to decide who was the inventor of the successful reaping and mowing machine:—

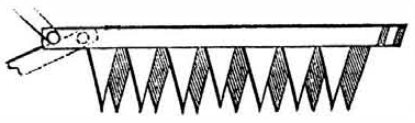
First. Every effort at reaping by machinery from the earliest time down to July the 2d, A. D. 1833, were failures.

Second. The double or slotted finger in combination with vibrating blades was not used by any other person than myself previous to the 2nd day of July, 1833. On that day this invention was put into successful operation by me, and its performance approved by an agricultural society then present on the field.

Third. Every successful reaping and mowing machine, of whatever name, which has been brought before the public since that time, is substantially of the principle invented by me, and put in successful operation by myself on the 2nd of July, 1833.

No change has been made in the cutting apparatus of my reaper since 1833, except an improvement to prevent choking, but several changes have from time to time been made in the construction of the woodwork, and in the arrangement of the gearing, to render the machine convenient and durable, and of lighter draught."

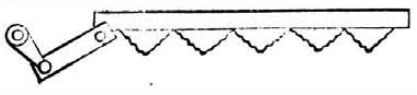
FIG. 37.



This completes Mr Hussey's brief and simple statement. In his original machine the guards were fastened at the top as well as the base, as shown in figure 34. To prevent choking, some portion of the top part was removed, and the support left entirely on the base; this was used in 1845 and patented in 1847. It will be seen that the success of Hussey's machine, is attributed by its author to the double fingers, and the cutter working between them. With the exception of the double fingers, the reaper of Wm. Manning, patented in 1831, and described in article 10, embraced all the features of Hussey's machine. Manning's had guard fingers below the cutter, but none above; and Dr. Jones, editor of the *Franklin Journal*, in criticising Hussey's patent, when granted, asserted that it was essentially like Manning's, only the double comb (guard fingers) which he doubted was an improvement, owing to the danger of choking. He was perfectly right in his anticipations, so far as it related to the choking, as has been stated; still the double comb is used, only it is supported at the base, not the top. 'Honor to whom honor is due." Manning is the inventor of the reciprocating cutter, combined with one set of guard fingers placed before it. Hussey added another set of fingers, and placed them above the cutter which he made to work between them; from this we date the success of reaping by machinery.

On June 17th, 1834, B. Jackson, of Ohio, obtained a patent for a rotary reaper, but we have not heard of it having been in operation. Four days after Jackson's patent was granted —June 21st—a patent was issued for a reaper, which since then has made perhaps more noise in the world than all the others, we refer to that of Cyrus H. McCormick, now of Chicago, Ill. This machine was constructed with a reel, and some other peculiar devices, but he "*particularly* claimed the cutting by means of a vibrating blade, (operated by a crank) having the edge smooth like figure 35, or with teeth like figure 36, and either with stationary wires, or pieces above and below, and projecting before it, for supporting

FIG. 38.



the grain while cutting; or in using a double crank, and another vibratory blade or cutter on the upper side, both working in contrary directions. This latter plan would give a kind of shear cut. We do not know what merit was claimed for this machine, but Dr. Jones, of the *Franklin Journal*, asserted that the *main* operating part was old.

In December of 1834, Enoch Ambler, of Root, N. Y., obtained a patent for a reaper, but we have not been able to obtain any information respecting its nature.

On April 22, 1835, Abraham Rundell, of Verona, N. Y., obtained a patent for the method of cutting by double cutters, figure 37, which have the form of Hussey's, and the combination of which was claimed by McCormick, they are double-acting scissors. We believe that no cutter of a single blade like McCormick's first, is now employed on any reaper, but blades embracing the features of Manning's; and this we find in the cutter now employed by McCormick in figure 38, which is composed of a number of distinct lance blades with serrated edges.

We are under obligations to the Hon. S A. Bridges, M. C., for valuable public documents.

## LITERARY NOTICES.

THE NORTH BRITISH REVIEW—The present number of this able work commences a new volume. It has been promptly re-printed and issued by its enterprising publishers. Messrs. Leonard Scott & Co., 54 Gold st., this city. The leading article is on "The Wonders of the Sea Shore," and is eminently scientific on zoophites, corallines, sea weeds, &c. There is an able article on Milman's History of Latin Christianity; a very beautiful one on Wm. Cowper, the poet—what a tragedy his life was. The concluding one is on the "Progress and prospects of the War." It contains eight original articles of great power. This Review has no superior; it is distinguished for its religious tone and general ability. It is the organ of the Free Church (Presbyterian) of Scotland, and occupies a high position in literature.—Messrs. Scott & Co. are the American publishers of the four Reviews—London, Westminster, Edinburgh, and North British, and Blackwood's Magazine. The yearly subscription price of the whole five is only $10 per annum; for any one of the Reviews, $3, a discount of twenty-five pe. cent. is allowed for clubs ordering four or more copies. This is an excellent time to subscribe for this solid, sound, and learned Review.

RUDIMENTS of ARCHITECTURE AND BUILDING—This is a very neat volume on the above subject for the use of architects, builders, draughtsmen, and engineers, edited by John Bullock, and published by Stringer & Townsend, this city. The first part contains a history of architecture, which is well illustrated with neat cuts of the different orders, viz., Doric, Ionian, &c. This is the largest and most valuable part of the book, and with it every young architect ought to be acquainted. It is written in a modest and unpretending style, the editor freely acknowledging how much he is indebted to others.

THE PHILADELPHIA MEDICAL EXAMINER.—We have received the December number of this monthly record of medical science, edited by D. S. L. Hollingsworth, and published by Lindsay & Blakiston, Philadelphia. It contains a full review of the famous case of Dr. Beale, the Philadelphia dentist who was recently sentenced to the State Prison, and respecting whom so much interest has been manifested by doctors and dentists, all of whom generally taking the ground that no such crime was ever perpetrated as that for which he was condemned.

THE UNIVERSE NO DESERT—THE EARTH NO MONOPOLY This is the title of a work published by James Munroe & Co., Boston and Cambridge. The main part of the work is preceded by a scientific exposition of the "Unity of Plan in Creation." We do not know who is the author, but no person would be likely to infer what its contents were from its title. It advocates the theory of Agassiz with respect to the distribution of animals, but it does not come boldly out with respect to different species of the human family, although it leans that way. The work is a natural history of the universe, too general in its nature to be profound, but is more than common-place.

THE JOURNAL OF THE FRANKLIN INSTITUTE, for this month, is an excellent number. It contains articles on Turbine Water Wheels, steam, and air, &c.

## Inventors, and Manufacturers

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